IBM i2 iBase
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Introduction
IBM® i2® iBase is a comprehensive repository application that is designed to enable collaborative teams of analysts to capture, control, and analyze multi-source data in a security-rich environment. Analysis results are disseminated as actionable intelligence in support of intelligence-led operations.

iBase is not just another repository. It provides an analytical environment that is designed with investigative analysis in mind. Its intuitive visual approach provides straightforward access to powerful analytical functions. Developed through ongoing collaboration with law enforcement, intelligence, national security, and commercial analysts since it was first released in 1995. iBase:

• Helps uncover hidden connections faster to help analysts deliver timely actionable results.
• Is highly configurable to suit data and operations oriented workflows across an organization.
• Is tightly integrated with IBM® i2® Analyst’s Notebook® for data entry, information exploration, and disseminating the findings as charts.

iBase incorporates IBM i2’s Search 360 technology that helps speed up informed decision making by searching for exact matches plus variants, within structured and unstructured information. Results are prioritized according to the context of the search, which can be across multiple record types. Search 360 helps to reduce the time spent searching for data, allowing more time for analysis, reducing the chance of oversights, and data duplication.

iBase models the world in terms of the links between entities, for example between people and their associates. Data is structured in the way that analysts think, facilitating:

• Increased analyst productivity
• Lateral thought
• Simplified identification of hidden data relationships

iBase makes creating new repositories and defining how you want to structure your data easier. With iBase Designer, you can adapt to changing situations and more easily create or modify your own multi-user repository without technical expertise.
There are significant variations in the range of features available with Access and early versions of SQL Server. These variations can be found in the areas of repository searches and queries, use of case controlled data, and data loading. Other limitations include coordinate import and conversion, repository administration and auditing, and implementation of the Extended Access Control security extensions.

Microsoft SQL Server Storage
If Microsoft SQL Server is used for data storage, iBase is suitable for large workgroups. It provides them with access to a repository potentially containing terabytes of linkentity data.

You need a SQL Server license for your server computer and Client Access Licenses for each client computer. IBM does not supply SQL Server licenses.
When used with a Microsoft SQL Server repository, iBase provides the following extra functions:

- Search 360 (available only when used with Microsoft SQL Server 2005, 2008, or 2012).
- Full Text Search including Name Variants.
- Semantic Queries.
- Alerting.
- Bulk Import (available only when used with Microsoft SQL Server 2005, 2008, or 2012).
- Audit History.
- All features of the Extended Access Control option (including the SCC function).

The following optional capabilities are available for iBase User:

- IBM® i2® iBase Geographic Information System Interfaces.
- IBM® i2® iBase Plate Analysis.

Details of all these optional capabilities can be found later in this document.

**Microsoft Access Storage**

When Microsoft Access is used for storage, iBase is suitable for mobile users or small workgroups of up to five analysts. Microsoft Access allows a maximum of two gigabytes of link-entity data. Search 360, Semantic Queries, Alerting, Bulk Import, the File loader, Audit History, and parts of Extended Access Control security are not available. To use these functions, you must upsize your Access repository to Microsoft SQL Server.

You need a Microsoft Access license for each computer. These licenses are not supplied by IBM.

The following optional capabilities are available for iBase User and iBase Designer when Microsoft Access is used for storage:

- iBase Geographic Information System Interfaces.

Details of all these optional capabilities can be found later in this document.

**Benefits of iBase Productivity**

iBase helps uncover hidden connections faster to facilitate analysts’ delivering timely actionable results.

- A singular user environment provides a wealth of analytical tools and Search 360 technology to speed up informed decision making. Search 360 helps overcome the difficulties of finding connections that are concealed by variations of structured and unstructured information across multiple records. Search 360 increases the available time for analysis and reduces the chance of oversights.
- iBase contains many features to enhance productivity, including intuitive, targeted, configurable keyboard shortcuts for quicker data entry and reduced fatigue from repetitive tasks. Session defaults provide a further aid for recurring data entry tasks.
- Design powerful queries easily. It is simple to create complex queries without needing to learn a complicated query language. Analysts interrogate the data rather than wasting time trying to understand whether they posed the intended question.
- By modeling the world in terms of the links between entities, data is structured in a way that analysts think which encourages lateral thought and increases analyst creativity.
- Analysts understand the terminology that is used which helps reduce application complexity and training costs.
- Gain a greater understanding of electronic communication data with the Cyber IP DNS Resolution module. The module allows cyber data to be enhanced and analyzed together with other intelligence in a single repository. The Cyber IP DNS Resolution module presents you with a complete view of data that pertains to an investigation.
Collaboration
• iBase is highly configurable to suit data and operations oriented workflows across an organization, including distributed repositories. Its alerting capabilities ensure that colleagues are aware of record accesses and changes that are made by others.
• iBase breaks down the barriers of document-centric working in Analyst's Notebook charts, making it easier to share information across teams and organizations.
• Share/exchange actionable intelligence across the global intelligence community. XML import and export facilities simplify data exchange between organizations.
• Identify patterns and connections in information that might otherwise be missed by combining structured data from iBase with information from Analyst's Notebook charts, the de facto application for visual analysis and briefing worldwide. Charts can be from your own or other agencies.

Configurable off the shelf application
• The schema can be designed by your organization to meet your data needs. Schemas are configured without need for SQL or programming skills.
• Provides flexible storage solutions. Use either a Microsoft Access or Microsoft SQL server repository based on your organization’s needs.
• Comprehensively manages all your data. Benefit from a scalable repository to handle ever increasing volumes of data. Enforce security and integrity through administrative control of audited user roles.
• Streamline data collection and management. The repository can be populated by entering new data through tailored worksheets, file imports, and transformations or by using other IBM i2 applications.
• Organize your analysis. Create collections of information that are relevant to your investigation.

• Easily hold data from multiple cases or investigations in one place and uncover significant commonalities within or between cases.
• Enhance iBase Search 360 with customizable synonyms that reflect your organizations data search needs.

Enhance benefits from existing IBM i2 product investment
• iBase can be used interactively with other IBM i2 products.
• iBase is tightly integrated with Analyst's Notebook for data entry, interactive information exploitation, searching and browsing, and results dissemination in the form of charts.
• Optionally incorporate new high-resolution icons into your schema to improve the appearance of charts that are displayed in Analyst's Notebook.
• iBase simplifies loading of Analyst's Notebook charts, which are included in Search 360 searches.
• The Chart Viewer enables the user to display charts and search their contents without need to start Analyst's Notebook.
• Get the maximum value from your existing Analyst's Notebook charts by using the Chart Item Extractor to deconstruct your charts into native iBase entities and links.
• A task pane gives users direct access to iBase functions from within Analyst's Notebook including direct access to Search 360.
• Close integration with IBM® i2® Text Chart for giving structure to documents, and other forms of unstructured data.

Key features of iBase Setting up
iBase Designer provides simple to use tools to define the repository schema (data model) in terms that analysts understand. You do not have to explain your repository schema requirements to a busy IT department or an external consultant, and then wait for them to schedule some time to create or update it. Your repository schema can be designed and implemented by an analyst.
Repository creation and maintenance tasks are simple. iBase Designer creates a new repository without requiring any knowledge of Access or SQL Server. IBM provides templates to help you to get started quickly by adapting the schemas supplied in the templates. You can add or remove entity and link types and assign fields to store your data values.

Is iBase available in languages other than English?

You can add and remove fields to entities and links, even when there is existing data. However, you must delete entities, links, and fields with care. To define a data field, you can choose from a list of types. Each type has its own characteristics and options that you set when a new field is created. The set of options includes a size for text fields, a display format for text and dates, default value, and a description.

Data fields can be defined to be:

- Indexed—which can increase the speed of searching on the field.
- Mandatory—making it essential that the user enters a value for the field before saving the record.
- Discriminators—contain information that makes a record unique, for example a social security number. Used when new data is added to avoid record duplications.
- Characteristics—fields that are useful for finding matching records.

There are twenty-seven user-definable, system, and calculated field types available to help you to design a schema that is tailored to meet your data and analytical needs. These field types include Text, Selected from Code List, Yes/No, Date, Time, Multi-line Text, Real Number, Hyperlink, Create User, and Calculated Date.

Additionally, iBase provides Standard fields. These fields are defined once, and are then automatically added to each entity and link type in your repository. Standard fields help consistency and reduce the time that is needed to define and maintain your repository schema.

iBase automatically constructs standard data entry and display forms for each entity and link type that you define. It also supports the creation of custom datasheets that can be designed to streamline data entry, or provide a structured view of the data. Custom datasheets are intuitively created and configured with the iBase Designer tools. Defining them requires no programming, or complex form definition languages to learn. The example shows a multi-paged datasheet that is designed to facilitate the input of crimes and the vehicles that are associated with these crimes.
You can also control how entities are linked in order to reduce data entry errors and simplify analysis. For example, you could prohibit linking a “Telephone” entity to a “Car” entity with a “Driver” link; but allow a “Car” entity to be linked to a “Person” entity with a “Driver” link.

**Foreign language analysis support**
iBase provides support for analysts who work in a multi-cultural environment as it is designed to support the storage, searching, and retrieval of textual information in multiple languages. Text in its native language can be stored alongside translated values, facilitating back reference to the original, enhancing data integrity and inter-agency working.

**Data entry and manipulation**
Once the schema is defined, you can quickly populate your repository. Successful investigation and intelligence analysis requires the ability to effectively store, manage, and retrieve large volumes of disparate data within an investigation. iBase makes it simple to get this information into your repository.

**Populating iBase with data**
iBase offers five modes for interactive data entry:

- Manually, using automatically generated forms or custom datasheets.
- Using Text Chart to mark up entity-link visualizations that are captured from unstructured text documents. Incorporate the data directly into the repository from Text Chart during mark-up, or by loading the completed visualization into the repository.
• Built in import facilities, which are configurable to load data from a wide variety of sources. You can import data from your corporate repositories and also from a wide range of external file formats, including Microsoft Office applications, files from devices (mobiles, camcorders, for example) and images (.bmp, .gif, .jpg).
  – During import, data is structured as entities and links ready for analysis. The importing process allows data to be transformed or converted as it is loaded. You can standardize your date formats, convert classification codes, transform geographical coordinates, or merge and split source data fields. iBase can also import all files from a folder and its subfolders where the files share a common structure. File metadata can be captured as part of the record during import.
• Chart item extractor can be used to create iBase entities, links, and properties directly from existing Analyst’s Notebook charts.

• When iBase is used with Microsoft SQL Server 2005 – 2012, a Bulk Import utility speeds up the import of large quantities of data.

In addition, automated data imports can be carried out using the iBase Scheduler. The scheduler can be configured to run imports automatically at selected times. Imports can be to be carried out during off-peak periods, keeping the repository up to date and to limit delays for interactive users. The iBase Scheduler is also used with the Bulk Import utility to allow overnight loading of large volumes of data.

**iBase Chart Item Extractor**

The iBase Chart Item Extractor takes items that are stored in Analyst’s Notebook charts, and loads them into the iBase data repository as individual entities and links. Chart item properties are taken from the chart items and stored in data fields.

Chart Item Extractor is useful where you have a number of separate charts with related information stored in them. Once the data is extracted from the charts into the repository, the relationships and commonalities between items can be readily analyzed and explored.

The chart extraction process is configurable by the user, giving control of how items in the chart are stored in the repository, maximizing the value of your chart data. Where there are no direct matches between the chart schema and the repository schema information can still be extracted in a structured format to an appropriate text field, where it is searchable with Search 360.

Items that are extracted from a chart can be grouped as iBase Sets to help manage the new information. Full traceability can be maintained by optionally storing the original chart, as well as links to all extracted items from the chart.
IBM Security

iBase can create a chart template to be used for creating new charts. The template ensures an exact correlation between chart items and the iBase data schema. When charts are being created in a location remote from the iBase repository, the template ensures that all captured information is extracted into the iBase repository.

Chart Item Extractor is provided as a user installable option for iBase.

iBase database subsets

Database subsets allow the creation of iBase repositories that are based on a subset of a master repository. Subsets are used in field or tactical operations, where use of the whole master repository would be inappropriate due to its size or security considerations. iBase database subsets are ideal for use by remote field operatives who capture new data for subsequent entry into a master repository.

After master repository initialization, data is selected and copied for a new subset iBase repository by using sets, queries or both. Users can create and save bundles of queries and sets in a group. Groups of queries and sets can be used to repopulate a database subset or create a new one when creating subsets is a regular operational procedure.
There is no restriction on the number of queries or sets that can make up the data bundle for a new iBase database subset. However, it must be noted that database subsets are designed to support the creation of small iBase repositories for tactical operations. The time that is taken to create and then synchronize the subset repository is directly dependent on the amount of data it holds.

Once created and populated, the subset repository can be used in the field independently and later synchronized with the master iBase repository.

During synchronization between the master and subset repository, record change conflicts can occur. The conflicts occur when a record is changed in both the master repository and the subset repository. When synchronizing, the user has two choices:

- Keep the master record changes, and discard the subset record changes.

Or

- Keep the subset record changes, and discard the master record changes. Optionally, the subset repository can be set to expire after synchronization with the master iBase repository.

Controlling access to your data

Because you can import data from a number of different systems, you can analyze data from multiple sources at the same time. For example, looking at both incident data and intelligence data. By combining data from your entire organization, you and other analysts can gain a complete picture of the available data for more in-depth analysis. This approach also allows different groups within the organization, or even other organizations to share data. The iBase approach allows data sharing while still maintaining control of who can see the data.

To provide secure access, identifiers and passwords are used to control access to repositories, either individually or as related groups of repositories. iBase security administrators can set up user name and password polices that can be applied globally to each user account. Changes to these settings apply to all users and allow the administrator to set up iBase security to match the latest corporate security rules.

An alternative to applying global user name and password policies is to allow iBase to work with Windows Active Directory to provide a single sign-on for users. The user is not prompted to enter a password if they have a valid account. Administration costs are lowered through reduced security administration workloads. The iBase login can be an active directory user name or group.

Once a user has access to a repository, they are subject to the following types of security:

- Case control.
- Whole repository permissions to read or alter data.
- Command access or denial, and usage monitoring.
- Folder objects to provide workgroup and private storage of analysis methods.

If you want to be sure that you are analyzing the data as it stood at a point in time, you can make the entire repository read-only. Analysts can create queries and sets but not change any record details.

For enhanced data access security, the Extended Access Control (EAC) feature provides control of data access on an entity, field, or even individual record level (with Microsoft SQL Server).
Case Control
iBase allows the data administrator to optionally create a repository where records are organized into distinct cases. Each case contains records that relate to a specific investigation. The repository can contain many cases.

Analysts can be allocated to work on single cases with “single case mode”, or use “multi-case mode” for cross-case analysis. Analysts are given access to one or more cases by the repository or security administrator.

Single case mode enables users to undertake activities such as entering and importing data, and analyzing events. With a single case, the user focuses only on those entities and links that relate to a particular investigation or a series of investigations.

Multi-case mode enables users to work with each of their allocated cases: for example, to query or report on data across several cases. In this mode, data access is read-only. Users can view records in all the cases to which they have access, but they cannot add, modify or delete any records in the repository.

Working in single case or multi-case mode delivers the following potential benefits:

- Enables the analyst to determine how they want to work with their cases. In addition, it provides the administrator with the ability to assign read-only analysts for cross-case analysis.
- Gives a focused or a broad view of the data in the repository as appropriate, enabling users to uncover significant shared references.

iBase Extended Access Control
The Extended Access Control (EAC) option provides greater levels of data access control. You can control access permissions that are related to entities, links, and fields in each repository. iBase EAC enables fine control over how individual pieces of data are made visible or changeable by groups of users.

Controls that can be set up cover:

- Denying access or changes to all records for a particular entity type or link type.
- Hiding administrative fields in records or making administrative fields read-only to certain groups of users.
- Making selected records of various entity types or link types inaccessible according to the Security Classification Code (SCC) given to each record. SCC values can be defined that are appropriate to your business, for example to deny access to data that relates to particular investigative cases.

If protected by an iBase EAC setting, iBase completely hides denied data items and does not reveal that they exist. Using iBase EAC helps security managers to implement an appropriate security policy to include close control of data access. iBase EAC gives your organization the following benefits:

- Assurance that data is protected from deliberate or accidental change.
- Assurance that sensitive data is protected from inappropriate viewing or other use.
- Simple and appropriate working environments for staff in different functional areas or operational groups.
Note SCC values cannot be used with iBase when it is using Microsoft Access for data storage or with case controlled repositories.

Extended Access Control is provided as a user installable option for iBase.

**Recording access to your data**
You may need to monitor who does what. The comprehensive auditing that is built into iBase can record actions, identify who reads the data, and can require a reason to be entered when a user runs certain commands.

Auditing includes a history option that can record the before and after values of any changes to the data.

In addition, users with the necessary permissions can view the changes that are made to a record and who made these changes. To allow for confidential operations, security administrators also have the option of hiding a person’s activities from users who could otherwise view the audit history of a record.

**Analyzing your data**
Once data is loaded into iBase, it can be analyzed with a wide range of searching and analysis tools. Queries in iBase are created by “drawing” your question; avoiding the necessity of learning a complex query language.
You can perform powerful searches on your data with wildcards, or use scored matches when not all identifiers are known confidently. iBase repository data can be sent to other integrated IBM i2 and third-party products, including the award-winning Analyst’s Notebook, for powerful visualization and analysis. Because iBase provides support for analytical workgroups, facilities are provided for you to save, organize and share queries, results and reports with others, or mark them as private.

**Query analysis**
You can use the powerful query tool to quickly create queries that are based on the questions you want to ask. Queries are created without the need to learn a complex query language. In the illustrated example, the user entered a description of a person they are trying to find, together with the information that is known about the target’s vehicle and telephone. The query results show the people that match the query together with their employer and family members.

Queries are powerful and can be used as building blocks for complex analysis. Query definitions can be saved for reuse. To increase the flexibility of saved queries, they can be defined to prompt the user for condition values when they are run. The results of one query can be used as input to another query. Analysts appreciate this feature as individual queries can be kept simple to understand and test, but when chained together become very powerful. Query results can be used in other analysis, display, or reporting activities. Sets can be used to collect query results for later use.
iBase is power2 enabled and supports semantic types; a way of tagging information in order to allow intelligent matching on the data. The example that is shown returns any entities that match the semantic type “Person” who have a field of semantic type “Person Last Name” beginning with “SMI”, and who work at a certain organization. The results would include both the “Person” and “Offender” entities. Semantic functionality is available with a semantically typed Microsoft SQL Server repository.

Sets
In iBase, a set is a collection of records for entities, links or both. Entities and links can belong to more than one set. You can use a set as a simple list of records to help you track your analysis. Alternatively sets can be used to support further analysis; as a source of records for scored matching, browsing, queries, visualization, reporting, and exporting.

If several sets are created, perhaps looking for the same entities and links by several different paths of analysis, iBase can compare those sets to see which records occur in just one set and, which occur in two or more sets.

Browsing
You can browse a list of records using browse definitions. They can display each record of a particular type, the results of a query or the contents of a set.

A user can specify which fields are relevant and which columns the data is to be sorted by, and then save the definition for reuse. Browse definitions can be set to run automatically when the user next logs into iBase, displaying any new or changed records.

For an individual entity, you can browse its link relationships with the link browser. Every link that is connected to the entity and the entities at the end of these links are displayed. The link browser is interactive, so that you can view the attributes of links, or link’ ends, and investigate distant relationships.
**Scored matching**

Scored matching provides a way of finding and listing relevant records in ranked order so that you can identify how well those records match multiple conditions. The result of a scored match is a list of entities of one type, which is listed in order of score; you can set a threshold value to exclude low scoring entities from the list.

It is a powerful tool when several fields and values contribute to what makes the records interesting to you.

Scored Matching saves you time, revealing significant leads for an investigation by searching your repository for likely suspects, when only a few characteristics are known.

**Reporting**

iBase reporting publishes lists of records on paper or in online formats to communicate information from your repository to colleagues or other organizations. You can specify simple reports, with only a few fields or records, or highly sophisticated reports that are based on complex templates. Templates can be saved for your regular reports so that you can present your analysis quickly and professionally. Reports can be printed, or created directly to Microsoft Word. Alternatively, reports can be posted to a web page, enabling your team to act quickly, inform others and allocate resources.
iBase can also generate reports directly to Microsoft Access. The experienced user can further customize the output, either with the Access report design tools, or a third-party report design tool. With Access reporting, the results of several reports can be combined into a single Access database, allowing reports to be created for more complex data relationships.

**Searching**

There are several ways to search for text in an iBase repository. The search options available depend on whether you use Microsoft Access or SQL Server for data storage.

**Search 360**

Available when SQL Server 2005 (or later) is used for data storage, Search 360 is IBM i2’s most comprehensive search technology ever. It helps users find records, documents, and charts more quickly and easily in a single search. The results are prioritized according to the context of the search, which could be across multiple record types. The intuitive search interface alleviates the need to understand the underlying data structure.

The database administrator can configure which elements within the repository schema are included in the Search 360 index. The administrator can choose to exclude either specific fields or record types from the index, constraining Search 360 to the most appropriate fields for the analytical environment. In this way both the size of the index, and the number of spurious results, can be managed by the administrator.

In the figure above, the user searched for “Hendricks” and entered “Rockville” as a related item. Search 360 found a connection between a “Gene Hendricks” and “Rockville” where “Rockville” was found in an address field of a location record that is linked to the “Gene Hendricks” person record.

With a SQL Server iBase repository (SQL Server 2005 or later), Search 360 finds records that match your search word by various methods. Each indexed record in the repository is searched, including records that contain embedded documents and Analyst’s Notebook charts. With exact match searches, allowances are made for letter case, punctuation, and accents and word order.
You can also use Search 360 to find records that contain similar text to your search words (a fuzzy match). The fuzzy matching on text inside Search 360 is based on eighteen years of intelligence and Law Enforcement experience. In this type of search, allowances are made for typing mistakes, missing spaces between words, spelling mistakes, name variants, and abbreviations.

The synonyms that are used by Search 360 for fuzzy matching can be tailored by the user to expand upon the default lists to meet the specific needs of the organization, department, or project. In addition, semantic types can be assigned to synonym items to give words extra meaning, leading to enhanced results from the existing Search 360 algorithms.

When Analyst’s Notebook is used with an iBase repository, Search 360 can be directly accessed from the Analyst’s Notebook task pane. Search results can be interactively added to the chart without needing to switch back and forth between programs.

**Word Search**

When Microsoft Access is used for data storage, the iBase Word Search feature is used to search your repository. Word Search quickly finds exact word matches, synonyms, and words that sound similar to your search criteria, which is useful for searching for spelling variations in names.

**Alerting**

Effective investigation and intelligence exploitation is often based on teamwork. iBase provides alerting facilities to notify users, co-workers, and managers if a record of interest is viewed in a record list, or returned via search, find, full-text search or a query; or any other place a record can be displayed in iBase.

With iBase alerting, users with appropriate permissions can set up alerts for themselves or for sharing with others. Alerts can be configured in several ways:

- Set up a named alert on a single record, on multiple records, or on a query and mark it as “of interest”.
- Be informed when changes are made to a record marked as “of interest”.
- That a query that is marked as “of interest” returns different results to the last time it was run.
- Be informed of a change while they are using iBase or optionally to receive notification via email.

When an alert occurs:

- A message is issued stating an iBase alert was triggered. The alert notification shows the user specified name of the alert.
- Neither an iBase alert nor an email notification contains record details, just a message that the specified alert was triggered.
- Users are able to review a list of the records that triggered the alerts. This list includes the user who accessed them.

Alerts are powerful in situations where multiple users share common intelligence data. Alerting allows collaboration where co-workers are studying the activities of common persons or objects as part of separate investigations or intelligence gathering tasks.
**Data maintenance and export**

iBase provides powerful functions to maintain your data once it is stored in the repository. Sometimes it is necessary to resolve duplicate records where multiple entities are created for the same item, perhaps as a result of issues with the source data. The Duplicate Records Checker makes it quick and easy to identify these records and to resolve the duplicates, by merging the multiple instances into a single instance. Each associated link is reassigned as part of the process.

Batch functions are also provided to help with the deletion or editing of multiple records, for example to change the value of a field for all records in a set, or to delete entities that are contained in the results of a query. The availability of these batch commands is controlled by the iBase administrator. iBase can be set up to help avoid data loss by overzealous deletions.

The soft delete option in iBase means that data is not permanently removed from the repository when it is deleted. Soft deleted data can be restored if necessary by an administrative user. Deleted records are permanently purged by an administrator when it is confirmed they are no longer required.

To provide data to non-iBase users, the export functions of iBase are used. Data can be exported directly to Microsoft Excel, or can be exported in formats that can be readily loaded into other software. Users can save their export specifications for reuse if necessary. The data to be exported can include each record of a certain type, the contents of a set, or the results of a query.

**iBase Coordinate Extensions**

If your repository is semantically enabled, you can also use the Analyst's Notebook smart matching function to help identify and merge duplicate iBase records that are displayed on an Analyst's Notebook chart.
Intelligence reports can contain coordinate data as part of the information about an incident. The coordinates could be recorded in a number of different coordinate formats, which often depends on their source. The formats can include MGRS, UTM, or Latitude/Longitude, and be based on a number of different geographic datums, including WGS84, ED50, and OSGB. In order to store the data in a format suitable for mapping from iBase it was previously necessary to manually convert the coordinates to a consistent format, and also adjust them to an appropriate datum, for consistent and accurate mapping.

The Coordinate Extensions option for iBase allows analysts, without specialist knowledge of coordinate systems to enter coordinates in their reported format, rather than requiring them to convert the coordinates manually before entry. Coordinates are validated as they are entered to limit user errors, and then automatically converted and stored as decimal degrees with a datum of WGS84. Coordinate transformations can also be applied when data is imported from a file.

In addition, when coordinates are analyzed in repositories it is often difficult to determine how close other entities are to a location of interest without sending the data to a map. Some coordinate systems further compound this difficulty as they can be given at different resolutions.

The Coordinate Extensions allow the analyst to build a coordinate query. These queries can be based either on a tolerance around a single point, or the opposing corners of a bounding box. The user is able to specify the coordinate to search around in any of the supported coordinate systems. The results are reported directly in iBase without the need for an external GIS application.

Coordinate Extensions is provided as a user installable option for iBase.

**Cyber IP DNS Resolution**

Cyber IP DNS resolution enables information to be added to Internet Protocol (IP) addresses stored in an iBase repository. This additional information includes hostnames, server geocodes, and spam blacklisting.

Cyber IP DNS resolution is provided as a user installable option for iBase.

**iBase Schema Update**

Schema Update enables a database administrator to apply an iBase repository template to an existing iBase repository. Schema Update modifies the repository schema to match the template. Organizations can create copies of a central repository for use at remote sites, and then update the schemas of these “copy” repositories to match the central repository as necessary.

In addition, the Schema Update functionality is used to update folder objects, which include queries, import and export specifications, and browse definitions from the central repository. A central administrator, for example, can send out a file of exported data records from the central repository, along with a new template containing a suitable import specification to load the data. Templates and data can be sent out on a CD, by FTP, WAN connection, or by email.

The updated template can then be applied to the remote repositories. The provided import specification is then run to load the exported data from the central repository. Remote sites can be kept up to date with the central repository without the need for a permanent direct network connection or an expert iBase user.

Schema Update can be used only where each of the repositories was created from the original source repository. Changes must be applied universally to each copy of the central repository. You cannot apply a template from a different iBase repository; each template is checked for compatibility before application.

Schema Update is provided as a user installable option for iBase.
**Product Access Management**
iBase, along with other IBM i2 products, now includes an optional feature for managing user access to the software to help maintain your organizations compliance with the IBM i2 software agreement. For more information about access management, see the IBM i2 Intelligence Analysis Portfolio Product Access Management Guide.pdf. Product Access Management is provided as a user installable option for iBase.

**Optional features available with iBase**
To further expand the capabilities of iBase, more options are available at extra cost. A brief overview of these options follows along with some examples of how they can be used.

**iBase Geographic Information System Interfaces**
The iBase Geographic Information System (GIS) Interfaces extend the visualization and analytical functions of iBase to include investigation of geographical relationships.

Using one of the supported GIS applications, data can be analyzed not only in its relationship to other data in the iBase repository, but also in its geographical context. Spatial factors such as road networks, communications lines, building density, and physical barriers can be taken into account when the information is analyzed.

The comprehensive GIS spatial analysis functions of your chosen GIS application can be used to analyze your data, or add extra data from other sources, which can be used with iBase information.

You can visualize the interrelationship without the need for complex data imports or in-depth knowledge of the GIS Mapping application. The iBase data loaded into a GIS application remains connected to the iBase repository so that the results can be added to sets or further analyzed using Data Miner or Analyst’s Notebook.

Supported GIS systems currently include Esri ArcGIS 9.0–10.1, Pitney Bowes MapInfo Professional 7.8–11.5, and Microsoft MapPoint 2004–2011.

iBase Geographic Information System Interfaces is available as an extra cost option for iBase.
iBase Plate Analysis
Information from automatic license plate recognition devices provides organizations with significant opportunities to increase their analytical capabilities. With these benefits, come the challenges of unlocking that potential and maximizing investment in camera technology.

iBase Plate Analysis delivers a set of dedicated tools for analyzing license plate information. The following tools are included:

- Convoy Analysis—Identify vehicles that regularly pass through the same cameras at similar times to a vehicle of interest.
- Geographical Profiling—Compare license plate reads around any number of event sites to discover vehicles that are seen at two or more of the sites during the days and times that are specified by the analyst.
- Find Common Vehicles—Analyze any number of sets that contain read license plates to discover common vehicles of interest to colleagues, or vehicles that appear in one or more current or previous investigations.
- Combine Vehicle Data Sets—An analyst can accumulate many sets when license plate records are analyzed. Combine Vehicle Data Sets extends the iBase set analysis function to allow the analyst to select as many sets as required. Then they can combine them for further analysis, such as profiling the movements of all the vehicles that are associated with a subject.
- Generate license plate list—Produce a list of license plate numbers from license plate records held in the iBase repository. Then use the list for Convoy Analysis, or as a filter on an iBase query to cross-check license plates against, for example, a list of vehicle makes, models and colors.

iBase Plate Analysis is available as an extra cost option for iBase.
Harnessing the power of iBase with other IBM i2 products

iBase provides full integration with Analyst’s Notebook, Text Chart, and the interfaces to GIS software. It can be used alongside other IBM i2 products.

iBase is power2-enabled and supports semantic types; a way of tagging information in order to allow intelligent matching on the data. Assigning semantic types to iBase repositories is optional. However, there are great advantages to using semantic types if you intend to use your iBase repository with other IBM i2 products:

- Analyst’s Notebook—provides smart matching of chart items that is based on semantic types. Analysts appreciate how data inconsistencies can affect their analysis and how time consuming it can be to overcome them.
- Using Analyst’s Notebook to chart data from an iBase repository with assigned semantic types allows smart matching to overcome different recordings of the same information. Smart matching can resolve accidental spelling mistakes, and different formats of the same information. Previously overlooked key associations are drawn to the attention of the analyst. In addition, these records can be merged within the iBase repository to eliminate any confusing duplicate information.
- Text Chart—semantic types can be used to align a Text Chart visualization with the iBase repository during loading. As an example, semantic types are used to resolve changes to iBase repository field names that are made after Text Chart data capture begins.

iBase IntelliShare

While iBase supports analysts in capturing, controlling, and analyzing multi-source data in a secure environment, IBM® i2® iBase IntelliShare opens up the intelligence held in the iBase repository to wider operational teams. Users access the rich intelligence in the repository through an easy-to-use web browser interface, freeing analysts to dedicate their time to developing intelligence and analytical products. This self-service access allows analysts and operational users to work concurrently and collaboratively on the same data to make better decisions faster.

Contact IBM for further details of iBase IntelliShare.

Technical description

Product architecture

iBase is a client/server solution, which is designed to store its data on a server computer. Ideally, this computer is a dedicated server that is not used for other functions. Analysts who use iBase connect to the server over a local area network.

Terminal Services or Citrix Presentation Server environment

iBase can be implemented in a desktop PC, Terminal Services, or Citrix Presentation Server environment. If you use Terminal Services or Citrix, the data is stored on a SQL Server computer and the iBase application is installed on one or more application servers. Users run thin-client sessions on the application servers and only display updates and mouse/keyboard input are transmitted over the network.
What pre-requisites are required to install the product?

You must be clear which environment client-server or thin client you will operate in before you select hardware for your iBase implementation. Guidance on current minimum hardware, operating system, and third-party software requirements is provided in the release notes: ibm.com/support/docview.wss?uid=swg27038010

Contact your Citrix or Terminal Services provider for advice on specification for your application servers in a thin-client environment.

iBase uses Microsoft Access or Microsoft SQL Server to store data. The Microsoft Access database engine is part of Microsoft Windows operating systems. When using Microsoft SQL Server the relevant software must be purchased separately. IBM does not supply Microsoft SQL Server.

Is iBase available in languages other than English?
iBase is available in languages other than English. For more information on the availability of specific language translations of iBase please contact your local IBM i2 representative.

How does iBase integrate with other IBM i2 products?
iBase can be integrated with many IBM i2 products, including Analyst's Notebook, Text Chart, Analyst's Workstation and iBase IntelliShare.

Can I upgrade from other IBM i2 products?
iBase is only supported when used with compatible versions of IBM i2 products, these include Analyst's Notebook, Text Chart, Analyst's Workstation. If you are using a combination of previous versions of these products, you must upgrade them all at the same time in order to maintain compatibility.

For more information
To learn more about IBM i2 iBase, please contact your IBM representative, or visit: ibm.com/software/products/en/ibase

To learn more about the IBM Safer Planet solutions, please visit: ibm.com/safer-planet