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Tailored Fit Pricing for IBM Z Offers Cost Effective Workload Growth Compared to Three Public Cloud Examples

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Fluctuating workload activity
Over time enterprise workload patterns have shifted from steady or gradual growth to unpredictable peaks and troughs. While once batch activity prevailed, today's workloads tend to be primarily transaction oriented. Real time analytics on data to gain insights, smart phone driven transactions and other market factors are driving workload volatility. This volatility impacts workload costs and has prompted the need for a pricing solution that aligns costs with actual resource usage.

Counter unpredictable costs
Tailored Fit Pricing for IBM Z® enables price stability, particularly in an unpredictable hybrid cloud environment. Tailored Fit Pricing Software and Hardware Consumption solutions are transformational, cloud-like pricing options for IBM Z that provide simple, transparent, and predictable pricing for IBM Z hardware and software when running workloads on IBM z/OS®. Tailored Fit Pricing options maximize cost predictability, while still supporting optimal response times and Service Level Agreements (SLA) compliance.

The Tailored Fit Pricing for IBM Z Hardware Consumption solution, or Tailored Fit Pricing for IBM Z Hardware[1], provides instantaneous access to additional capacity for short, unpredictable spikes in business-critical z/OS workloads. It is designed to meet the demands of hybrid cloud workloads on IBM Z. Your IBM Z system can now include, on top of the base capacity that you own, a fixed corridor of pay for use capacity. This always-on corridor of consumption priced capacity can help you to alleviate the impact of short unpredictable spikes in workloads that are becoming more common in today's digital world.

Tailored Fit Pricing benefits
With Tailored Fit Pricing for IBM Z, IBM Z hardware can provide:

- An always-on, pay for use corridor of capacity that sits on top of your already purchased base capacity.
- Instantaneous access to additional capacity for short, unpredictable spikes in business-critical z/OS workloads throughout the day.
- Always-on ability to scale IT resources to meet technology demands in a cost-effective way during busy times.
- Standardization and transparency to hardware capacity planning, growth, and investments on IBM Z.

Tailored Fit Pricing Software and Hardware Consumption solutions introduce cloud-like pricing models for both new and existing workloads in which compute is measured on a per-MSU consumed basis, enabling greater cost predictability and savings. Both solutions remove the need for clients to focus on rolling average utilization windows.

[1] Customers interested in the IBM Z Hardware Consumption solution must also opt for the Tailored Fit Pricing for IBM Z Software solution. The hardware solution is available on IBM z15 while the software solution requires z/OS V2.2 or later and a z15 or z14 system.

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Tailored Fit Pricing for IBM Z is a flexible, cloud-like pricing model for your IBM Z infrastructure that is designed to:

- Take full advantage of all the IBM Z capacity you own
- Peak and spike without usage "penalty[2]"
- Optionally subscribe to additional hardware capacity to mitigate unexpected spikes in workload activity
- Smooth seasonal, sporadic, and event-driven workload activity
- Grow at an attractive per MSU price

Tailored Fit Pricing for IBM Z is designed to considerably reduce the need to cap or restrict the available amount of infrastructure and offers the following advantages:

Flexibility in Managing Workloads
Customers who manage their workload activity to optimize a capacity-based license model often move their workloads to fit within existing licensed capacity.

Tailored Fit Pricing for IBM Z is designed to offer an increased level of agility at a lower comparative price point which can facilitate alignment of costs with business revenue for future workload growth.

Increased Availability
The practice of moving workloads to fit within currently licensed capacity can drive unnecessary costs in personnel and can introduce the risk of disruption to normal operations. Tailored Fit Pricing for IBM Z is designed to allow users to schedule workloads when needed, to help reduce workload schedule administration and to avoid potential scheduling errors.

Easier Batch Window Management
Because the solution is designed to allow users to schedule workloads when needed, batch window management can become simpler. Programmers can schedule batch jobs according to business requirements rather than focusing on software license requirements. This can also mean that batch workloads can be more aggressively run to complete within shortened batch windows.

Reduced System Programmer Labor
Moving workloads to fit within currently licensed capacity can often require significant planning and implementation by system programming personnel. Tailored Fit Pricing for IBM Z is designed so that this work effort can be minimized, freeing programming resources for more productive work.

[2] In this context penalty is considered by many users to be an increase in payment. Customers often constrain their workloads to avoid peaks so their four-hour rolling average (4HRA) remains below an established threshold. Since allowing a workload to peak can increase the 4HRA, a higher payment may occur.

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Tailored Fit Pricing versus public cloud costs

The following total cost of ownership and operating expense comparison model illustrates the cost benefits of Tailored Fit Pricing for IBM Z that can be achieved versus public cloud pricing structures. The model examines four new workload deployment scenarios, one on IBM Z and three on public cloud environments. Each scenario entails deploying a new Java™-based application and a relational database. The workload is expected to grow 5% annually and is assumed to require 50% production capacity at a remote facility to comply with government disaster recovery regulations.

Scenario 1 (IBM z15TM): The IBM z15 scenario includes an existing 6,000 MSU capacity environment with a mix of applications workloads on z/OS for a total of 10,000 MSU capacity. Sysplex is configured with capacity backup (CBU) for disaster recovery at a different site. Deployment of the new Java-based application, running WebSphere® and Db2® on z/OS®, is estimated to require the purchase of an additional 4,000 MSU of production capacity. To mitigate workload spikes and improve cost predictability, the IBM Z scenario also includes use of Tailored Fit Pricing for IBM Z Software and Hardware options that assume an additional 20% of hardware capacity for the new 4,000 MSU workload. This additional workload capacity, equating to 8%, or 800 MSU of the new workload, represents the environment's Tailored Fit Pricing for IBM Z hardware capacity corridor. Additionally, the IBM Z production and Sysplex environments were adjusted for 5% year to year growth.

Scenarios 2, 3 and 4 (Public Cloud Examples 1, 2 and 3): The 4,000 MSU workload on IBM Z was sized to estimate a comparable number of vCPUs in a cloud environment[3]. Each cloud scenario includes a software stack comprised of a commercial database, database and systems management tools, and WebSphere Hybrid Edition on the cloud. The stack is licensed per vCPUs for the maximum amount of hardware required for on-demand provisioning. In year one the cloud environment would require 2,460 vCPUs. Subsequent annual vCPUs were then increased to accommodate for 5% year-to-year growth[4]. The public cloud scenarios also took into account the use of network-attached storage to enable optimum access. Like the IBM Z scenario, the public cloud scenarios included an additional 20% in peak production hardware and software licenses to represent the additional capacity corridor available to the IBM Z workload.

The Average Operating Expense (OPEX) chart (Figure 1) shows the average OPEX comparison of Tailored Fit Pricing on IBM z15 versus three compared non-IBM public cloud platforms (Public Cloud Example 1, Public Cloud Example 2 and Public Cloud Example 3) over a projected 4-year time frame. OPEX, for the purpose of this comparison[5], is comprised of

[3] IBM Z MSU to vCPU conversion is based on Qualified Performance Indicator (QPI) IDC data https://www.idc.com/about/qpi

[4] Cloud Public scenarios assumed 2,460 vCPUs in Year 1, 2,586 vCPUs in Year 2, 2,715 vCPUs in Year 3, 2,851 vCPUs in year 4 and 2,993 vCPUs in Year 5.

[5] Differences between growing workloads on IBM z15 with Tailored Fit Pricing and public cloud solutions are based on a client use case modeled by the IBM IT Economics team. The model compares hardware, software, labor, networking, floor space, energy, storage, and disaster recovery environment costs for workloads undergoing growth over a five-year period. The model analyzed initial investment costs in year one (2 IBM Z servers with 32,000 MIPS that grow to 38,897 MIPS in the 5th year and 2,460 vCPUs in year one to 2,993 vCPUs in year five for the public cloud scenarios to account for comparable functionality on IBM Z, including HA, development, test, and disaster recovery. Sixty-four vCPU capacity instances were used for the public cloud scenarios in Year 1 (986 database and tools vCPUs and 1,474 WebSphere

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software, hardware, storage, floor space, networking, and energy starting in Year 2. The costs in the comparison also include incremental software acquisition costs on the cloud required for growth.

The OPEX comparison covers years 2 to 5 and thus excludes the initial investment in IBM Z hardware in scenario 1 or software acquisition costs for public cloud in scenarios 2, 3 and 4. The cost model found that the average OPEX for Public Cloud Example 1 was 100% higher compared to IBM z15, that Public Cloud Example 2 was 62% higher compared to IBM z15, and that Public Cloud Example 3 was 125% higher compared to IBM z15[5].

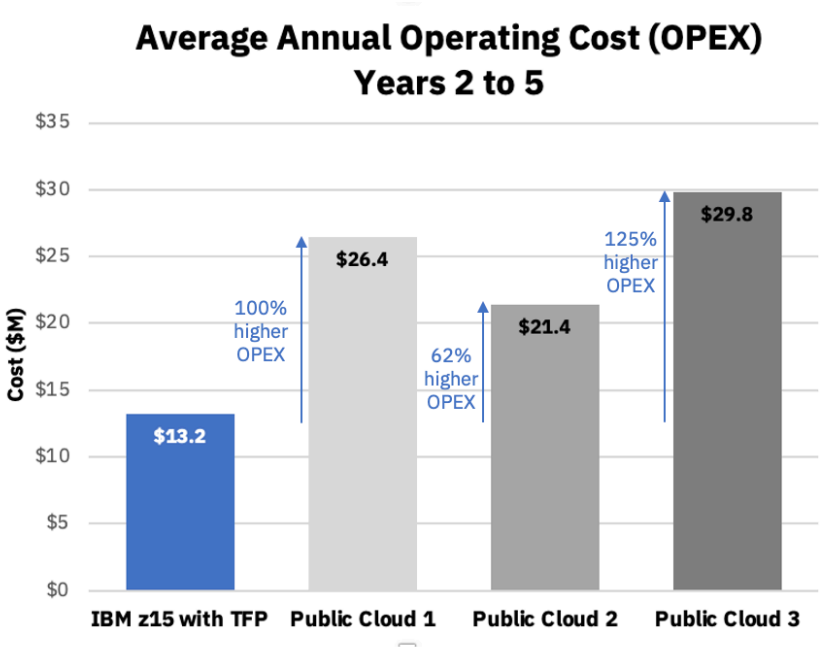

Figure 1: Average Operating Expense (OPEX) for Years 2 to 5

The Accumulated TCO Cost Comparison chart (Figure 2) shows a cumulative cost comparison of Tailored Fit Pricing on IBM z15 versus the three public cloud examples over a projected 5-year time frame. Cumulative costs are computed by adding in the initial investment (Year 1) plus incremental annual expenses incurred each year for total cumulative cost (Year 5).

Hybrid Edition vCPUs). Cloud storage was calculated to be 4,800 TB versus 1,600 TB for IBM Z based on client storage environments examined in IBM IT Economics assessments. IBM and ISV software were used in the model (IBM software included z/OS, Db2, WebSphere, system management tools, and third-party software comprised scheduling application and database utilities). OPEX costs during years 2 to 5 were used to determine total cumulative costs for the different scenarios (Year 1 initial IBM Z hardware investment and software acquisition costs for public cloud in scenarios 2, 3 and 4 were excluded). IBM Z hardware and software costs are based on IBM U.S. pricing and OPEX charges for cloud examples are based data from IT Economics assessments with clients. For additional information on the use case model, contact the IBM IT Economics Team at IT.Economics@us.ibm.com.

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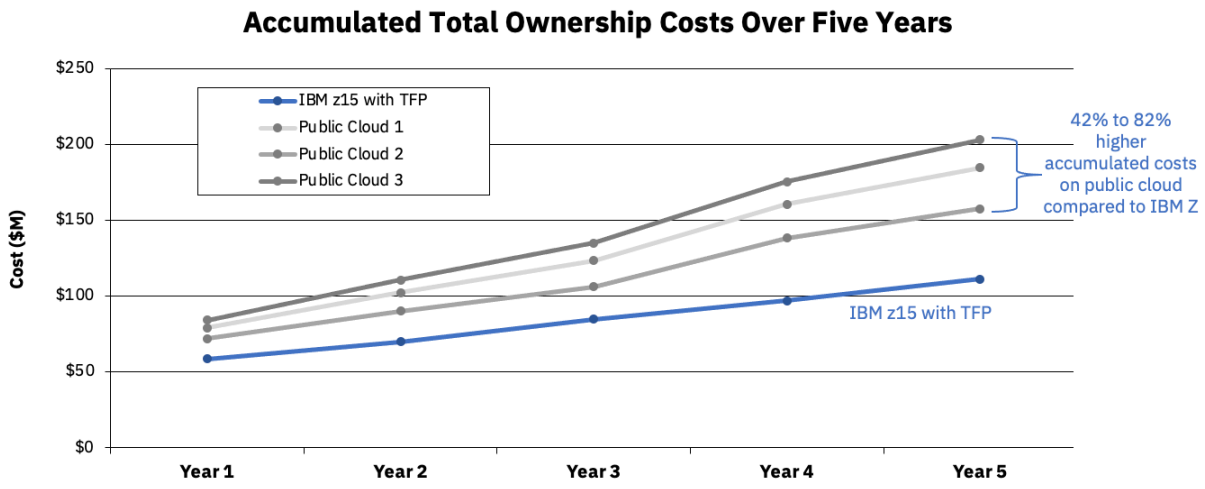

Figure 2: Accumulated TCO Cost Comparison

The model's accumulated TCO costs indicate that growth on non-IBM public cloud platforms can be 41% to 81% more expensive than on IBM z15 using Tailored Fit Pricing[5]. It also shows a significant cost difference between IBM z15 and cloud implementations in Year 1 (Figure 3) resulting from a large upfront investment in software licenses to run the workloads in a public cloud. The model also found that an up-front investment in software licenses may not yield an eventual reduction in cost, since operational costs on the cloud in this analysis were found to be higher than on IBM z15 (refer to the key cost drivers section and Figure 5).

Table of Accumulative Ownership Costs by Year

Accumulative Total Ownership Costs	Year 1	Year 2	Year 3	Year 4	Year 5	5 Year TCO Difference	5 Year TCO % Difference
Tailored Fit Pricing on IBM z15	$58,489,727	$69,870,169	$84,883,042	$97,076,908	$111,335,047		
Public Cloud 1	$79,060,135	$102,278,525	$123,329,389	$160,585,348	$184,790,018	**$73,454,971**	**66%**
Public Cloud 2	$71,868,863	$90,113,854	$106,208,538	$138,418,029	$157,581,149	**$46,246,102**	**42%**
Public Cloud 3	$84,021,894	$110,601,344	$134,981,287	$175,640,710	$203,179,963	**$91,844,916**	**82%**

Figure 3: Accumulative Ownership Costs by Year

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Cost of extra capacity to manage workload variability

As described in the Tailored Fit Pricing versus public cloud costs section, all four scenarios assumed that 20% of additional capacity would be needed to manage seasonal, sporadic, and event-driven workload activity. The cost model found that the Tailored Fit Pricing for IBM Z Hardware's capacity corridor option was significantly more cost-effective than acquiring extra capacity in the public cloud scenarios. Enabling a 20% capacity corridor on IBM Z for five years was found to add a 2.4% cost increase to the solution while 20% extra capacity for Public Cloud 1 was 5.9%, Public Cloud 2 was 8.9% and Public Cloud 3 was 7% (Figure 4).

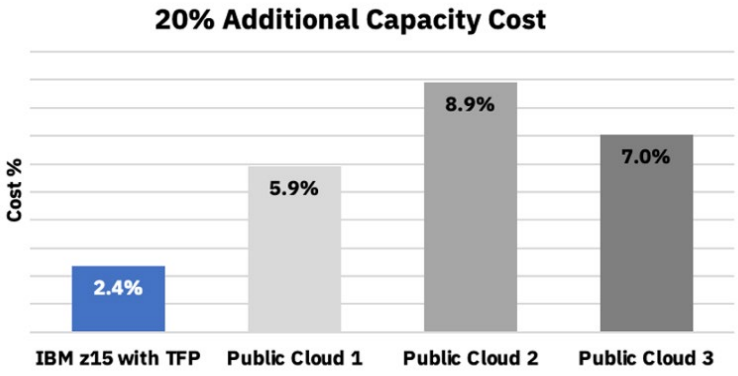

Figure 4: Increase in cost for 20% additional capacity

Key cost drivers in workload growth model

Figure 5 shows the distribution of the three most common cost drivers in the model, software, hardware, and storage[6]. For the public cloud scenarios, the leading cost driver was software with 79% for public cloud 1, 92% for public cloud 2 and 74% for public cloud 3. In contrast, software costs for IBM Z were considerably lower at 32% resulting from the use of Tailored Fit Pricing.

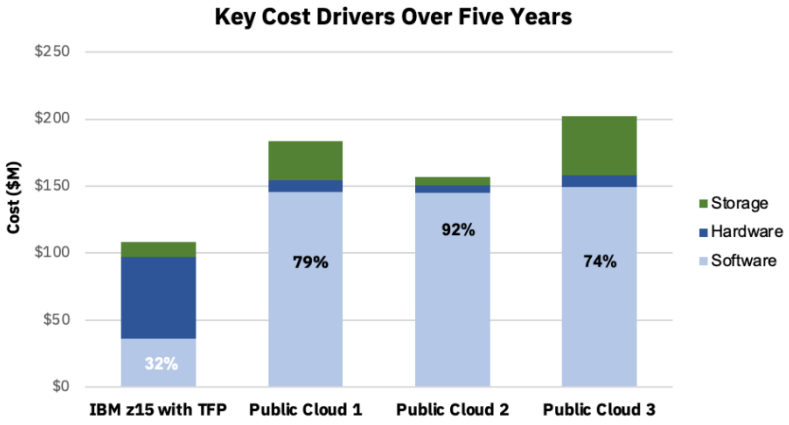

Figure 5: Distribution of storage, hardware, and software costs over five years

[6] Other costs, for example energy, floor space and networking, were excluded from the chart since they represented 1 or less percent.

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To understand why software costs can be less expensive on IBM z15, we examined software use terms in typical public cloud environments versus IBM Z environments using Tailored Fit Pricing Software and Hardware Consumption solutions.

Middleware and application software license over-provisioning in public clouds
While cloud hardware can be released during idle times, software that is licensed on a per core basis cannot be released. This can result in high software maintenance costs given that charges can apply to software that is not always in use.

Core-based software license charges
This applies not only to the maintenance cost of core-based software licenses on the cloud but also to one-time acquisition costs for software as the environment grows and incremental licenses are needed. Unless unlimited usage, or other types of software agreements are in place, these one-time charges must be paid.

Versus

Software consumption model avoids over-provisioning
IBM z15 customers can reduce software costs with Tailored Fit Pricing since the pricing model meters usage and charges for software based on actual usage rather than on the number of licensed cores or the peak consumptions.

IBM Z software tiered pricing model encourages growth and consolidation
IBM Z software provides tiered pricing for MLC products with lower usage cost per MSU in higher tiers. Deploying new workloads on an existing IBM Z infrastructure can provide customers with the benefit of substantially lower costs due to tiered IBM Z software pricing.

Tailored Fit Pricing can help reduce IT costs
Tailored Fit Pricing for IBM Z is designed to deliver scheduling flexibility, transparency, and predictability of pricing, even in the constantly changing era of hybrid cloud and digital demands. Tailored Fit Pricing for IBM Z helps mitigate the cost impact of workload dynamics by providing always-on cloud-like hardware capacity while still supporting optimal response times and SLA compliance. Cost model findings[5] illustrate that with Tailored Fit Pricing for IBM Z customers can grow workload activity on IBM z15 with lower TCO and OPEX costs than on public cloud.

Find savings in your enterprise
While actual savings will vary according to types of workloads and IT environment specifics, most enterprises, in particular those anticipating workload growth, can achieve cost efficiencies by opting for Tailored Fit Pricing for IBM Z. If your organization is interested in exploring pricing model comparisons, ask for an IT Economic assessment. This analysis is available at no-charge and can help identify cost savings and operations efficiencies for growing IT environments. Contact IT.Economics@us.ibm.com for information on a Tailored Fit Pricing assessment.

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