Real World Experiences With IBM's Newest Software Pricing Options for z/OS
Part 2 – DevTest Containers

Session 25298

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Welcome

- Thank you for coming along.

- Who are we?
  - Watson & Walker founded in 1988 by **Cheryl Watson** & **Tom Walker**.
  - Publisher of *Cheryl Watson's Tuning Letter* since 1991.
  - 10 people, >300 years experience, spread over 3 continents.
  - After the Tuning Letter, our primary focus is on helping our customers understand their software bills, and select the pricing options that deliver the best value for *them*.
  - We are completely independent, not beholden to any vendor, so we can offer objective information based on our collective experience, what we see in other customers, allowing clients to make a fully informed decision.

- This session is for *you*, so *please* ask questions as we go along.

DISCLAIMER

- EVERYTHING to do with software pricing comes with exceptions.

- The exceptions usually have exceptions too.

- Except when they don't. But that is exceptional too, because everything should have an exception.

- The information provided in this presentation covers *most* cases, with some 'wiggle room' around the edges for customizing to your environment.

- DevTest Container is an IBM pricing option that impacts the costs of your *IBM products* (both MLC *and* IPLA). How any other vendor might or might not support this is a matter between you and those vendors.

DISCLAIMER

- Our experience is that nearly every software pricing option has a set of customers that it will be a good fit for.

- And there will also be a set that are really *not* a good fit for that offering.

- Therefore, the *only* global guidance we offer is
  - "Model it this (or any software pricing option) using your numbers, and see how it would have affected you if you had done it 12 months ago, and how it would affect you based on your plans for the coming 12 months (at a minimum)."
  - Ensure that you understand all the non-financial benefits, advantages, drawbacks, and gotchas.
  - Using all this information, make an *informed* decision about whether that option is right for *you*.
  - Be *especially* careful of any options that are irreversible.

Agenda

- WHY DevTest Container?

- WHAT is a DevTest Container?

- WHO?   Only *you* can answer that.

- A little more detail to help you decide if it is appropriate for you.

- Some planning/preparation/implementation tips.

- Prereqs, references, terminology, and so on.

- Summary.

- What is a DevTest Container?

> And before you ask, **NO**, it doesn't have ANYTHING to do with Docker, zCX, VMWARE, Kubernetes, swarms, plagues, locusts, or anything else.

- A pricing mechanism to let you:
  - Fix the IBM MLC cost of your "pre-production" workloads at current levels, while still being able to significantly grow the capacity used by those workloads.
    - For simplicity and consistency, I will use the term DevTest to cover everything that comes under the "pre-production" umbrella.
  - Logically separate off the MSU consumption of DevTest workloads from production ones for billing purposes.
    - From a very high level MLC costs perspective, the net effect is similar to if you moved all the DevTest work to a completely separate environment.
    - You might picture the DevTest container as being in a separate CPC that uses full-capacity pricing, with the CPC size being the agreed size of your container.

Why DevTest Container?

- The following bullets are from IBM *and* our customers that have implemented this option.

- Many customers SEVERELY constrain capacity available to DevTest systems during peak times.
  - Because DevTest LPARs typically need to be licensed for every product you have (so they can be tested), those LPARs typically have a 'high' cost per MSU.
- This might achieve the objective of reducing your software bill.
- However, the impact on application developer productivity can be immense.
  - Unfortunately, development costs are often not paid for by the same person that pays the software bill, so that is 'NMP' (Not My Problem).
- Impact on perception of z/OS by the user community can be huge.
  - We have stories of applications being moved OFF z/OS because *other* platforms were perceived to offer better performance and availability!

Why DevTest Container?

- Why is this needed?

- Resulting abysmal performance drives developers to other platforms, simply so they can get their job done.

- If the application development work moves to another platform, the next logical move is to move the production version of that application as well.

- Severely limiting resources available to DevTest systems, or only making capacity available at anti-social times, means that less testing can be carried out in the finite window before the application delivery deadline. As a result, more bugs are found in production, impacting application availability, possibly performance, and user perception of this platform.

Why DevTest Container?

- Why is this needed?

- Forcing testing to run at atypical times (for example, only at weekends, or when the CPC is otherwise idle) can mean that applications are not tested in a similar environment to what they will encounter in production.

- Techies spend their time fending off irate users/developers, rather than applying their skills and experience to deliver *real* value to the company.

- Predicting actual costs can be really complex:
  - If a job runs outside your peak R4HA, its contribution to your bill is $0.00.
  - If a job runs during the peak R4HA, it can potentially significantly impact your bill.
  - The DevTest container addresses this by fixing MLC costs for non-prod workloads, as long as consumption remains below agreed thresholds.

Why DevTest Container?

- Why is this needed?

- IBM offers about 30 pricing options for z/OS-related products. It *might* be possible to achieve the same savings using some combination of those options, but you really need to know what you are doing, and the use of multiple options makes management more complex. Setting up a DevTest container *might* be a piece of cake compared to those other options.

- Some customers limit which products can run in which LPARs (because most products are billed based on the size of the LPARs they run in, NOT on the CPU consumption of the product itself). *After* you sign up for a DevTest container, any of the MLC products in the container at that time can be run in as few or as many of the DevTest container LPARs as you like – such changes have no impact on the MLC price until you outgrow the container size.

Why DevTest Container?

- Why is this needed?

- Finally (until we encounter some more), constrained DevTest environments can increase development elapsed time. If you rely on contract staff, this elongation increases real development costs, because the developers must be retained for longer.
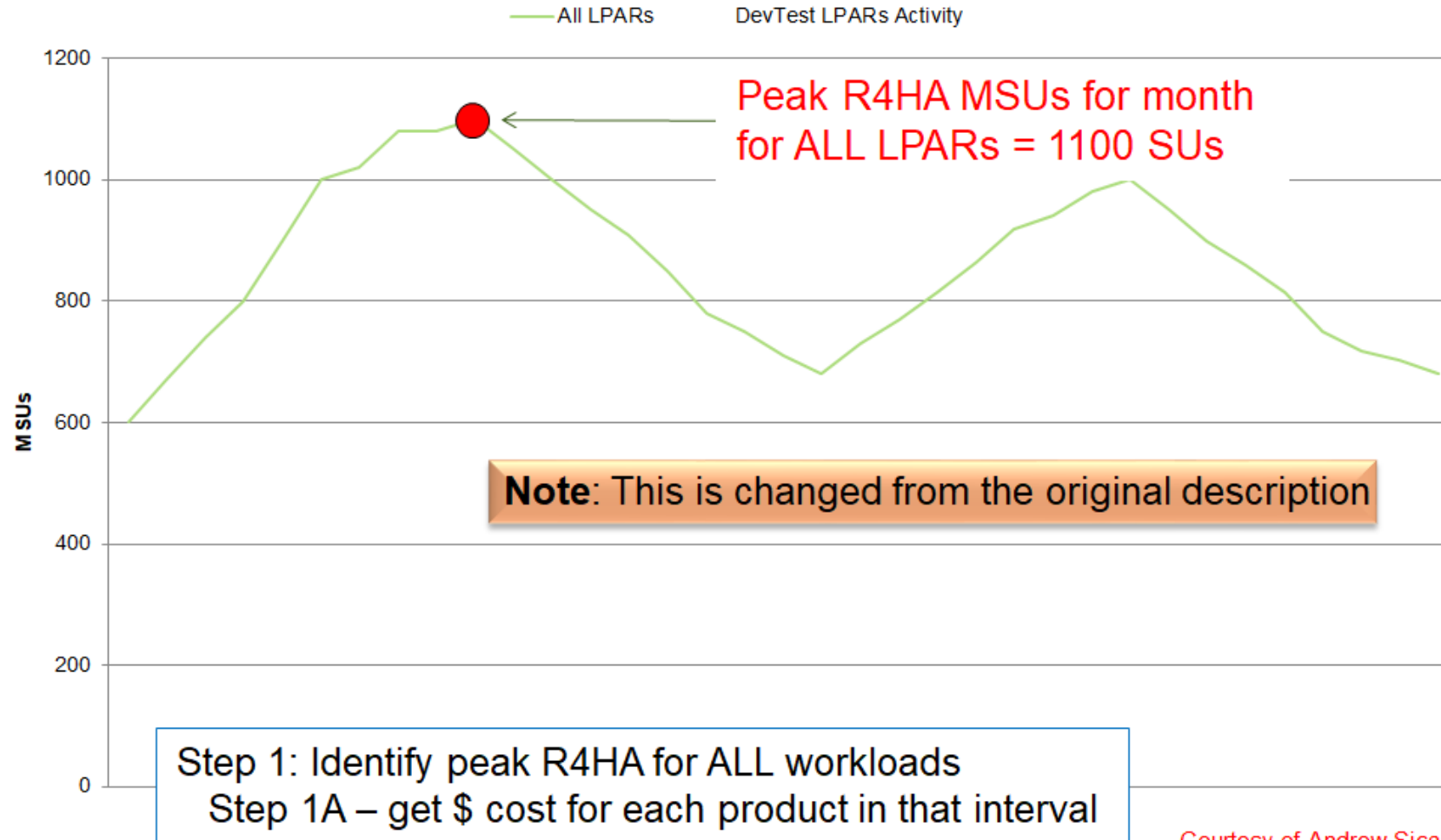
How does it work?

- If this sounds like it might be beneficial in *your* environment, let's look at how it works.

- Let's first have a look at how prices and container sizes are determined.

- There are 3 things to consider:
  - How much will the *container* cost? ($s)
  - How will the cost of *everything else* be determined? ($s)
  - How big can the container get without impacting the SW (MLC + IPLA) cost of the container? (MSUs)

Container

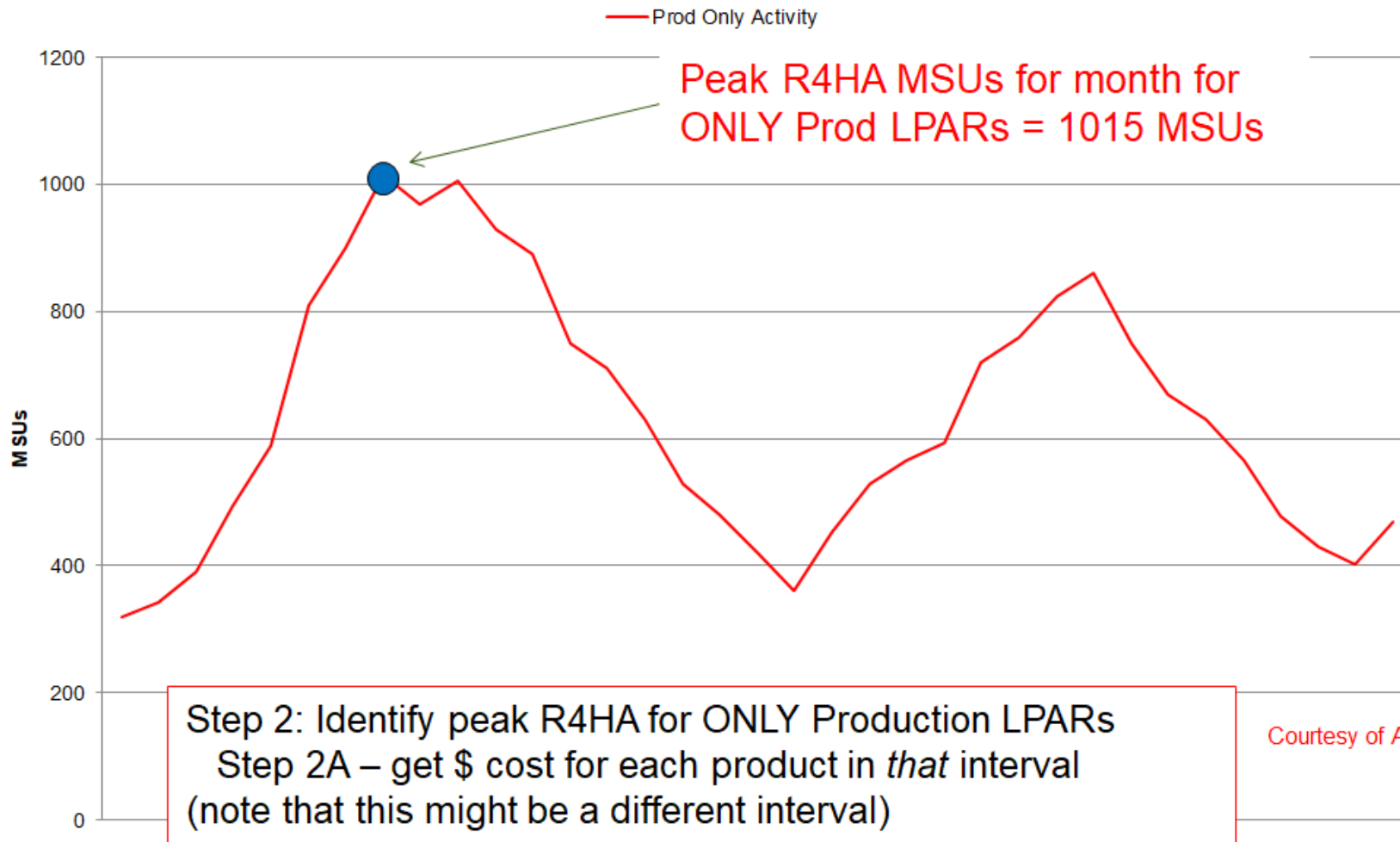Logical
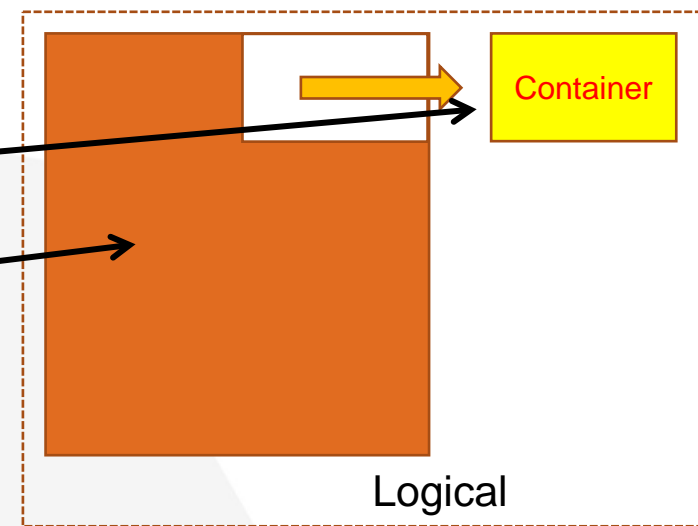
How much will the container cost?

1. Determine cost of ALL LPARs today.
   - This is *unaffected* by whether you currently use zNALC, zCAP, MWP, etc.
2. Determine what the cost of ONLY production would be.
   - **Note** – the peak R4HA for *just* the production work is probably different to your current peak R4HA that includes everything.
   - Again, this is *unaffected* by whether you currently use zNALC, zCAP, MWP, etc.
3. Your container MLC cost is = 1 (ALL) minus 2 (Prod only).

- Let's look at an example

How much will the container cost?

How much will the container cost?

Prod Only Activity

Peak R4HA MSUs for month for ONLY Prod LPARs = 1015 MSUs

Step 2: Identify peak R4HA for ONLY Production LPARs
   Step 2A – get $ cost for each product in *that* interval
(note that this might be a different interval)

Courtesy of Andrew Sica, IBM

How much will the container cost?

- To determine the *container cost*, subtract the Prod-only cost from the ALL Cost.
  - In practice, IBM actually performs this set of calculations for each of your IBM MLC products for three consecutive months (you get to select *which* three consecutive months you will use from the last six month period) and uses the average of the three months.

  - **Very important point** – they are NOT using the size of the DevTest LPARs at the time of the overall peak. By using the <u>peak-for-the-month</u> Production MSUs, this minimizes the cost of the DevTest container.
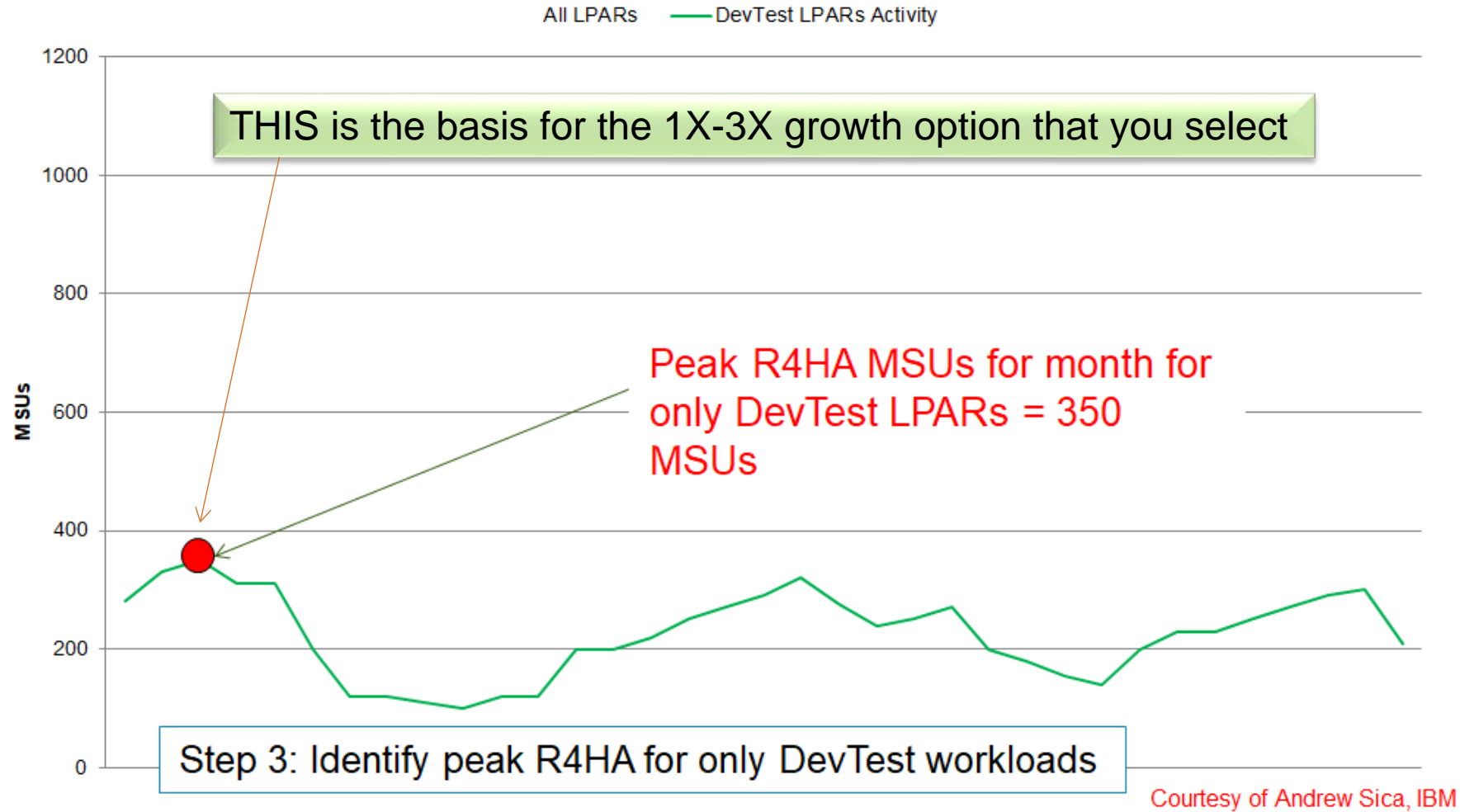
How much will the container cost?

- So that was how the fixed price of the *DevTest container* is calculated.

- The cost of the *production* workload in each month *after* you sign the DevTest agreement is calculated by SCRT deducting the R4HA of the DevTest container from the 'ALL' R4HA.

    - You end up with a *variable bill for production*, based only on the R4HA of the production workload, plus a *fixed bill for the DevTest container*.

    - Whatever happens in the DevTest container should theoretically have 'no' impact on production. (In practice, if growing DevTest workload increases CPC utilization, that will have a knock-on impact on every LPAR on that CPC).

How much will the container cost?

- Last thing we need is to know how large the DevTest workload can grow to without impacting its MLC costs.

- The IBM [announcement letter](#) said that "*The Application Development and Test Solution allows clients to increase their entitlement for current, z/OS-based development and test environment capacity, **up to triple its existing size**, with no capacity-based increase in MLC software charges for that workload.*"

- What, precisely is "its existing size"?

How much will the container cost?

All LPARs ——— DevTest LPARs Activity

THIS is the basis for the 1X-3X growth option that you select

Peak R4HA MSUs for month for only DevTest LPARs = 350 MSUs

Step 3: Identify peak R4HA for only DevTest workloads

Courtesy of Andrew Sica, IBM

How much will the container cost?

- There are a few things to note here:
  - We had 3 *different* peak R4HAs to be considered:
    - One for ALL LPARs.
    - A different one for ONLY the Production LPARs.
    - A different one again for ONLY the DevTest LPARs.

  - At the time of the peak of ALL LPARs, the DevTest LPARs were using about 200 MSUs.
  - However, the difference between the peak for ALL LPARs (1100) and the peak for only the Production LPARs (1015) was only 85 MSUs, so effectively you will only pay for 85 MSUs for the DevTest container.
  - But the *peak* for the DevTest container was 350 MSUs – this is your DevTest base.

- IF you select the 3X option, that means that the DevTest container could potentially use up to 1050 MSUs at *any* time, including in the same interval as the Production peak, and you would effectively only pay for 85 MSUs for the MLC products in the container.   That is pretty impressive (and *way* more than the advertised 3X).

How much will the container cost?

- To be precise, IBM performs this calculation for each MLC product in the DevTest container, for each of the 3 consecutive months that you specify.

- Then they get the *average* price for each product.

- The sum of those will be the fixed price for your container.

- Note that this is now a fixed price (except for annual price increases or TUP changes) for as long as that contract is in place.
  - As long as you don't exceed the agreed container size, the MLC price will not go **up.**
  - Equally, if all your developers win the Lotto and go to the beach for July, meaning that the R4HA of the DevTest container plummets for July, your price will not go **down.**

A little more detail

- Still interested?

- Let's get into a little more detail….

A little more detail

- The DevTest Container option was originally announced in July 2017 (announcement letter 217-490), then subsequently refined in October 2018 (announcement letter 218-324).
  - See these documents for the formal terms and conditions.

- The second announcement letter is much more specific about which workloads should be included in the container.   Basically, EVERYTHING other than production LPARs, *must* be in there – Development, Test, stress test, sysprog sandbox, etc. YOU CANNOT cherry-pick the 'good' candidates.

A little more detail

- Both collocated workloads (DevTest work running in the same LPAR as production) and dedicated DevTest LPARs are supported.

- If you want to include collocated workloads in the container, they MUST be classified accordingly by WLM into Tenant Resource Groups.

- However, for dedicated LPARs, all that needs to be done is to associate the LPAR with the container when you run the SCRT job.

- The information about <u>which workloads</u> will be considered eligible, and <u>how they are identified</u>, will be included in the contract.

- **NOTE:** Especially if you have collocated workloads, you need criteria that are 'reasonable' – not a list of 100,000 test jobs, not changing every other day, must be verifiable, must be something that WLM service classification can filter on.
  - And remember that you need at least 3 month's worth of SMF data to form your base case.

A little more detail

- There is less value from the container in a collocated environment because all of the system components (JES, GRS, XCF, Catalog, etc) are shared with production, and therefore cannot be included in the container.

- Also, setting up a collocated environment is a *lot* more complex.

- It is also more difficult and time-consuming to evaluate than dedicated LPARs.

- All of the customers that we have worked with to date that have implemented a DevTest container have only included dedicated DevTest LPARs.

- For this reason, we will not get into all the WLM changes that you need to make if you have collocated DevTest work that you would like to include in a DevTest container – but if you ARE interested in that, see Andreas Henicke's Session 25713, *Workload Management (WLM) Update for Pricing, z14, and z/OS*.

A little more detail

- The PRICE of the DevTest container depends on your current bill. If you have already taken actions to reduce your bills (use of MWP, for example), that reduction will be reflected in the price of the container.
  - **NOTE**: Once you move the non-prod LPARs into the DevTest container, those LPARs can no longer use those pricing options.

- If you are considering both CMP and DevTest container, you *might* want to do CMP first.
  - We are finding that the monthly peak R4HA moves around more when using CMP.
  - In those situations, it seems that the DevTest container delivers more value if done after the migration to CMP.
  - MODEL it for yourself to determine the impact in both scenarios.

A little more detail

- You specify which multiplier you want at the start of the contract – it can be *any* number between 1X and 3X.
- Taking the previous example, if you specify a 1X multiplier, that means that the DevTest workload can have an R4HA of up to 350 MSUs at *any* time.
  - There will be no increase in the MLC for the container.
  - Those MSUs are ignored when SCRT is calculating the R4HA for the production LPARs.
    - So now DevTest can peak at the same time as production, rather than at 3AM on a Saturday.
  - So there IS a potential real benefit from using a 1X DevTest container.
- If you exceed the agreed container size, the price of the container will bump up by 20% of the CMLC price for those additional MSUs from that month onwards.
  - **If you are getting close to exceeding the container size, SPEAK TO IBM.**

A little more detail

- Another scenario where you might end up with a DevTest container is if you are considering one of the Tailored Fit Pricing (TFP) options, IBM will want you to move all your DevTest work into a DevTest container, leaving only production work under the TFP umbrella.

A little more detail

- This offering is primarily aimed at growing, or artificially constrained, installations.

- If your DevTest usage is on a downward trajectory, this could cost a little more than if you did not opt to use the container.

- However, even if it costs a little more, the flexibility it provides, together with the predictability of a fixed price, might be worth more to you than the additional cost.
  - And maybe if you can provide a more user friendly Development environment, there might be less enthusiasm for moving development to a different platform.

A little more detail

- This sounds too good to be true! What are the gotchas?

- There might not be any increase in your MLC costs to provide loads of additional MSUs to your poor, starved, developers. But, you still have to provide the hardware MIPS to deliver that capacity.

- If you have any ISV products licensed on a full capacity basis, adding hardware capacity would likely result in increased costs for those products.
  - But it will still be cheaper than adding MIPS and having to pay for those products PLUS all your MLC products.

A little more detail

- Be careful if you have LPARs that you use for stress testing.
  - If you run a large test during the 3-month base period, you could end up with a container that is much larger than you need for 99.9 of the time.
    - BUT, remember that the numbers are averaged over 3 months, so the additional MSUs for that large stress test will be somewhat diluted by the averaging.
  - If you do NOT run a test during those three months, but do run one in a subsequent month, you could blow right through the agreed container size.

A little more detail

- IBM IPLA Software.

- The basic rule is that you need sufficient Value Units for your FULL Container size, plus enough for the production peak R4HA.
- This quickly gets really complex, because there are 3 different IPLA pricing models:
  - Execution-based. Pay based on where the product runs.
  - z/OS-based.   Pay based on where z/OS runs.
  - Reference-based. Pay based on where some other product runs.
- There are also full capacity and sub-capacity options:
  - Full cap – you pay based on installed MSUs.
  - Sub-cap – you pay based on R4HA of the LPARs, as determined by the pricing model above.

A little more detail

- IBM IPLA Software.

- For full cap, *generally speaking*, it doesn't make much difference, because you have to pay for all installed capacity.

- For sub cap, YOU MUST PAY **NOW** FOR THE FULL AGREED (1X-3X) CONTAINER SIZE. This is limited only by the installed capacity.
  - And remember that IPLA sub cap is not like MLC sub-cap – the bill does not go up and down as the peak R4HA rises and falls. It only ever goes up.
  - Even though you pay for the Value Units up front, there is also a yearly S&S charge.
  - So if you have one disasterous month where you blow through all your limits, you will need to purchase additional VUs for the peak R4HA, AND you will be paying S&S on those VUs forever.

A little more detail

- IBM IPLA Software.

- Pricing gets really complicated for Reference-based or z/OS-based products. Can also result in unpleasant surprises if you have IPLA products that are licensed on only a subset of your CPCs today.

- Make sure that all of this is clearly spelled out in the contract, and that you fully understand the financial implications, both at the time you start the contract, any time you purchase additional HW capacity in the future, and if you exceed the agreed container size.

A few tips

- STRONGLY recommend that you evaluate all this before you contact IBM. In particular, have an agreed set of LPARs that will be in the container.

- Identifying all the numbers that are required for the contract is time consuming for IBM *and* for you – you don't want to keep changing your mind and going through that process over and over.

A few tips

- If you have softcap groups that contain production and DevTest LPARs today, it might not make sense to have those same groups when some of the members of the group have a fixed price, and others have a variable price.

- If you are going to give the DevTest container more capacity than it has today, make sure to adjust the LPAR definitions and weights accordingly. In particular, keep an eye on your HiperDispatch topology.

A few tips

- If you are going to do this, do it right.
- Don't just pick random months.
  - We recommend that you go back *at least* 1 year and evaluate each rolling 3-month period.
    - You must select from the 6 months prior to signing the contract, but understanding seasonal changes might indicate that it would make sense to wait some x months.
  - Remember how the container price is calculated – price of all LPARs less price of production LPARs.   You might have <u>zero</u> change in the DevTest container LPARs from month to month, but changes in *production* LPARs could increase or decrease the cost by thousands or tens of thousands.
  - And remember, the price that you agree *will not change* until you renegotiate the contract, so a 'small' difference in one month can add up to hundreds of thousands over the life of the contract.

Tools

- IBM has a Devtest calculator tool – available at https://cap-calc.mybluemix.net/software/lms/dev-test/home.
  - Only for dedicated LPAR containers – not for collocated containers.
  - Shows MSUs, but not prices.
  - Not sure how it handles IPLA products – there doesn't appear to be any documentation about what it provides or how it works.
  - Requires 3 SCRT runs *for each month* that you want to evaluate.

- Watson & Walker can do it for you – about to announce a formal packaged offering that will take 12 months of data and show you the price and MSUs for each rolling 3-month interval.

Prerequisites

- Only supported for workloads running on z13/z13s or z14/ZR1.

- Requires z/OS 2.2 or later.

- 2.1 is supported if all containers are dedicated LPARs.

- PTFs to numerous products – monitor IBM FIXCAT IBM.Function.PricingInfrastructure to ensure you are aware of all required fixes.

- Must submit required paperwork to IBM (expected to be similar to that required for zCAP) and receive their approval.

- Each approved solution will have a unique Solution ID.

New Terminology

- What would new pricing be without some new terminology? If you are negotiating with IBM, you will need to understand these new terms:

- **DevTest MSU Base Period** - This is the 3-consecutive-month period that is used to determine the base MSUs and MLC for the DevTest container.

- **DevTest MSU Base** - The average of the peak R4HAs for the DevTest workload over the three months in the DevTest MSU Base Period.

- **DevTest MLC Base Charge** - The difference between the MLC cost of all workloads, and the MLC cost of only the production workloads, averaged over the Base Period.

- **DevTest Solution MSUs** - The agreed capacity (up to 3X the DevTest MSU Base) of the DevTest container as decided by the customer when the agreement is signed. The R4HA of the DevTest container can grow to this number of MSUs without affecting the MLC cost of the container.

Reference information

- If you would like more information, please refer to:
  - Cheryl Watson Tuning Letter 2018 No. 3 article *IBM Container Pricing*
    - There was also a more *introductory-level article* in Tuning Letter 2018 No. 1.
  - IBM July 2017 Announcement Letter 217-490.
  - IBM October 2018 Announcement Letter 218-324.
  - SHARE in Pittsburgh 2019, Session 25713, *Workload Management (WLM) Update for Pricing, z14, and z/OS*, by **Andreas Henicke**.
  - IBM Manual *Using the Sub-Capacity Reporting Tool*, SC23-6845.
  - Or talk to us about running a 3-day Software Pricing Workshop on *your* site.

Other sessions

- Other Watson & Walker sessions this week:
  - Wednesday 3:30, Room 408, Session 25634, *Customer Experiences Saving MSUs Through CPC Optimization*, **Frank Kyne** and **Todd Havekost**.
  - Thursday 11:15, Room 408, Session 25297, *Real World Experiences With IBM's Container Pricing for Z - Tailored Fit Pricing*, **Cheryl Watson**.
  - Friday 10:00, Room 407, Session 25214, *Watson & Walker zRoadshow*, **Frank Kyne** and **Mario Bezzi**.

Summary

- If you have constrained development environments, this *seems* like a very attractive option, especially if you have unused MIPS that you are holding back because of SW cost considerations.

- If you perform 'unnatural acts' to limit the cost of your development environment, this *seems* like a very attractive option.

- If you are flat or growing, or *maybe* even if you are slowly shrinking, this *seems* attractive.

- **DO NOT** ignore or under-estimate the complexity the IPLA/OTC considerations. And don't forget that the trend appears to be that all new IBM products are IPLA rather than MLC – and DevTest only helps with your MLC costs.

- Bottom line – to get the best value, you **HAVE TO** model this, using your own data. We strongly recommend going 1 year back using your own SCRT data and projecting 1 year forward. Having determined the financial benefit/cost, apply all the other benefits (productivity, simplicity, flexibility) and **make a fully informed decision.**

Thanks for coming!

- We hope you enjoyed this session.
- If you have questions or would like some independent help in investigating if this would help *you*, please [let us know] and we will help if we can.

- Please remember to rate this session - 25298