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IBM System z Announcements Encourage Channel Consolidation

ON July 23, IBM made a series of hardware, operating system and software announcements for the zEnterprise platforms. There were several parts of each announcement that pertained to I/O and channel technology. One common denominator of each of these parts was that they 1) encourage a movement toward consolidation of channels on the host, and 2) encourage avoiding direct attached FICON channels and adopting switched FICON architectures.

The first channel subsystem enhancement IBM announced was very big news: IBM announced increased addressing with up to 24k subchannels per channel (port) for the FICON Express features. To help facilitate growth as well as continuing to enable server consolidation, IBM now supports up to 24k subchannels per FICON Express channel (Channel Path Identifier or CHPID). End users can now define more devices per FICON channel, which includes primary, secondary and alias devices. The maximum number of subchannels across all device types addressable within an LPAR remains at 63.75k for subchannel set 0 and 64k-1 for subchannel sets 1 and higher. This support is exclusive to the zEnterprise EC12 (zEC12) and the zEnterprise BC12 (zBC12) and applies to the FICON Express8S, FICON Express8 and FICON Express4 features when defined as CHPID type FC. This is supported by z/OS, z/VM and Linux on System z.

The z/OS Version 2 Release 1 announcement stated that the zEC12 and zBC12 servers incorporate improved channel load balancing algorithms, designed to provide more consistent I/O rates across the channel subsystem and help improve I/O response times, even when abnormal conditions occur. In support of this new function, z/OS V2.1 is designed to provide an updated health check based on an I/O rate-based metric, rather than on initial control unit command response time.

Dynamic Channel Path Management (DCM) for FICON channels was originally introduced in z/OS V1.11 with support for a single, intermediate FICON switch between the channel and control units. In z/OS V2.1, z/OS is designed to enhance DCM to support FICON channel path connections through two intermediate switches. This is intended to make it easier to use a smaller number of channels (channel consolidation) and optic fiber connections for FICON I/O, particularly for multi-site installations. To go along with these improvements in FICON DCM, in z/OS V2.1, a number of usability and performance improvements are provided for the z/OS FICON Discovery and Auto Configuration (zDAC) function. These include improved support for DCM for FICON channels, improved processing of device number-constrained configurations and those with constrained unit addresses for specific channels, a new capability to enable users to specify switch and CHPID maps to guide path selection and improved discovery performance.

The next improvement made with z/OS 2.1 that will help drive channel consolidation is with z High Performance FICON (zHPF). The initial support for zHPF in z/OS V1.11 was for data sets accessed using the media manager component of DFSMS, including VSAM data sets. z/OS V1.13 added support for QSAM, BSAM and BPAM, and allowed EXCPVR callers to use zHPF channel programs. With z/OS V2.1, EXCP is supported. This function is also available for z/OS V1.12 and V1.13 with the PTF for OA38185. This is intended to provide function that programmers can use to achieve significant I/O performance improvements for programs using EXCP.

The final item I believe merits attention is an IBM Statement of Direction pertaining to the removal of FICON Express4 support on System z: The zEC12 and zBC12 are planned to be the last System z servers to offer support of the FICON Express4 features. FICON Express4 won't be supported on future System z servers or carried forward as part of the upgrade. IBM goes on to state that enterprises should continue migrating from the FICON Express4 features to the FICON Express8S features.

Taken separately, each of these items announced by IBM may not mean as much. However, when you put them all together, taking into account the earlier zEnterprise I/O enhancements such as the PCIe technology and I/O drawers, you can see that IBM is making a very compelling technical case for channel consolidation on the mainframe. A compelling case is also made for the adoption of fan-in/fan-out architectures using FICON switching technology in lieu of direct attached storage for its z114 and zBC12 clients. ETJ

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