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IBM® GDPS® and Server Time Protocol (STP) Application Qualification support for the following Dense Wave Division Multiplexing (DWDM) Platforms: The Huawei OptiX OSN 9800 running NeSoft release 5.51.15.15, OptiX OSN 1800 running NeSoft release 5.67.09.11 and the OptiX OSN 902 running NeSoft release 5.169.02.15.

International Business Machines Corporation and Huawei Technologies Co., Ltd. have successfully completed application qualification testing of the following Dense Wave Division Multiplexing (DWDM) Platforms: The Huawei OptiX OSN 9800 running NeSoft release 5.51.15.15, OptiX OSN 1800 running NeSoft release 5.67.09.11 and the OptiX OSN 902 running NeSoft release 5.169.02.15, for the following IBM Z®, Parallel Sysplex®, and Geographically Dispersed Parallel Sysplex™ (GDPS), IBM z14® (z14), IBM z14 Model ZR1 (z14 ZR1), IBM z13® (z13), IBM z13s® (z13s), IBM zEnterprise® EC12® (zEC12), IBM zEnterprise BC12® (zBC12), IBM zEnterprise BladeCenter Extension® environments:

• GDPS / Peer-to-Peer Remote Copy (PPRC) (Metro Mirror) using the following protocols:
  - High Performance FICON for IBM Z (zHPF®) & FICON for Storage Access
  - FCP for disk mirroring
  - 10G RoCE based Coupling Express® Long Reach (10G CE LR)[1] or 1x InfiniBand (1x IFB)[4] for exchanging Server Time Protocol (STP) messages to provide synchronization of servers
• GDPS / Extended Remote Copy (XRC) (z/OS Global Mirror) using zHPF & FICON for asynchronous remote copy
• zBX intraensemble data network (IEDN) over 10 Gigabit Ethernet (10 GbE)
• 10GbE RoCE Express[2] feature (Remote Direct Memory Access over Converged Ethernet) using Shared Memory Communications – Remote Direct Memory Access (SMC-R)

Distances for the protocols supported for these GDPS applications are defined in the Qualification Results Summary below. Although STP applications have been successfully tested to a distance of 200km, IBM requires an RPQ – 8P2581 (zEC12), 8P2781 (zBC12), 8P2981 (z14, z13), 8P2781 (z14 ZR1, z13s) to assure applications between 100km and 200km adhere to the bounds of our qualification. This is due to the critical requirement of assuring that no more than 900 meters of differential delay was introduced into the network. Additional testing may be required to approve the RPQ if the application exceeds the distance tested noted in the table below with *.

Qualification Results Summary:
The Huawei OptiX OSN 9800, OptiX OSN 1800 and the OptiX OSN 902 Dense Wavelength Division Multiplexing (DWDM) Platforms met IBM Qualification criteria for the protocols listed in the table below.

Cards supported in the OptiX OSN 9800 Platform - Running NeSoft Release 5.51.15.15				
Module and Firmware	**Description**	**Part Number**	**Protocols Supported**	**Supported Distance**
17LTX[R] Firmware: 6.85	10 Client Ports, 1 (100G) Line Port Maximum Port Configurations Supported Per Protocol: 10:1 8G FC/FICON/ISL 10:1 10G ISL 10:1 10GbE/10G CE LR/zBX/RoCE for SMC-R 10:1 PS IFB 5G	TN17LTX Ver A	IFB 5 Gbps (DDR), 8 Gbps FICON/FCP/ISL, 10 Gbps ISL, 10GbE, 10G CE LR[1]	100km*

Cards supported in the OptiX OSN 1800 Platform - Running NeSoft Release 5.67.09.11

Module and Firmware	Description	Part Number	Protocols Supported	Supported Distance
F3LTX[R] Firmware: 3.81	10 Client Ports, 1 (100G) Line Port Maximum Port Configurations Supported Per Protocol: 10:1 8G FC/FICON/ISL 10:1 10G ISL 6:1 16G FC/FICON/ISL 2:1 32G ISL 10:1 10GbE/10G CE LR/zBX/RoCE for SMC-R 10:1 PS IFB 5G	TNF3LTX Ver A	IFB 5 Gbps (DDR), 8,16 Gbps FICON/FCP/ISL, 10,32 Gbps ISL, 10GbE, 10G CE LR[1]	100km*

Cards supported in the OptiX OSN 902 Platform – Running NeSoft Release 5.169.02.15

Module and Firmware	Description	Part Number	Protocols Supported	Supported Distance
M201[3] Firmware: 5.17	2 Client Ports, 1 Line Port Maximum Port Configurations Supported Per Protocol: 2:1 16G FC/FICON/ISL 2:1 32G ISL	TNJ1M201 Ver A	16 Gbps FICON/FCP/ISL, 32 Gbps ISL	100km*

[1] Coupling Express LR links are only supported on the z14, z14 ZR1, z13 and z13s servers.

[2] 10GbE RoCE Express for SMC-R is only supported on the z14, z14 ZR1, z13, z13s, zEC12 and zBC12 servers. DWDM client modules that support 10GbE RoCE Express for SMC-R are noted in the table above with [R].

[3] The M201 client card only supports 850nm Multimode optics for 16Gbps FC/FICON/ISL and 32Gbps ISL.

[4] PS-IFB is not supported on the z14 ZR1.

GDPS Application Limitations:
- IBM GDPS support is limited to DWDM product applications which utilize point-to-point fixed dark fiber network interconnect between Parallel Sysplexes.
- DWDM end-to-end networks, including DWDM components, transport elements and dark fiber links, must not exceed the equivalent of 900 meters differential delay between transmit and receive paths used for GDPS links for Server Time Protocol (STP) message passing (which includes 10G CE LR and 1x IFB links).
- Fiber-based dispersion compensation units that have not been qualified by IBM are not supported for STP applications.
- Redundant DWDM platforms, utilizing two site-to-site fiber pairs over diverse routes, are recommended for fiber trunk protection of links used for STP message passing (10G CE LR and 1x IFB). STP links should connect using different trunk switching modules to ensure that a fiber trunk protection event does not interrupt all timing links simultaneously.

Results achieved were in a test environment under laboratory conditions. IBM does not make any representations or warranties regarding Huawei products. Huawei retains sole responsibility for its products, the performance of such products and all claims relating to such products, including without limitation its products' compliance with product specifications, industry standards and safety and other regulatory requirements.

The terms IBM Z, z14, z13, z13s, zEC12, zBC12, zEnterprise, Coupling Express, ESCON, FICON, GDPS, Geographically Dispersed Parallel Sysplex, IBM, Parallel Sysplex, zSeries, and z/OS are trademarks or registered trademarks of International Business Machines Corporation

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Qualification Letter Version History:
- 03/19/2019: Initial Version
- 04/03/2019: Corrected F3LTX Firmware Level
- 02/27/2020: Specified CE LR as 10G CE LR