IBM Spectrum Scale for Linux on z Systems Hands-on Lab Parts 1 and 2 17212, 17475

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Clustered and Distributed File Systems

Clustered file systems

- **File system shared by being simultaneously mounted on multiple servers accessing the same storage**

- Examples: IBM Spectrum Storage, Oracle Cluster File System (OCFS2), Global File System (GFS2)

Distributed file systems

- **File system is accessed through a network protocol and do not share block level access to the same storage**

- Examples: NFS, OpenAFS, CIFS

<u>**Available for Linux for System z:**</u>

- **SUSE Linux Enterprise Server**
  Oracle Cluster File system (OCFS2)

- **Red Hat Enterprise Linux**
  GFS2

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What is IBM Spectrum Storage?

- **IBM's *shared disk*, *parallel cluster* file system**

- **Cluster**: 1 to 16,384 nodes, fast reliable communication, common admin domain

- **Shared disk**: all data and metadata on storage devices accessible from any node through block I/O interface ("disk": any kind of block storage device)

- **Parallel**: data and metadata flow from all of the nodes to all of the disks in parallel.

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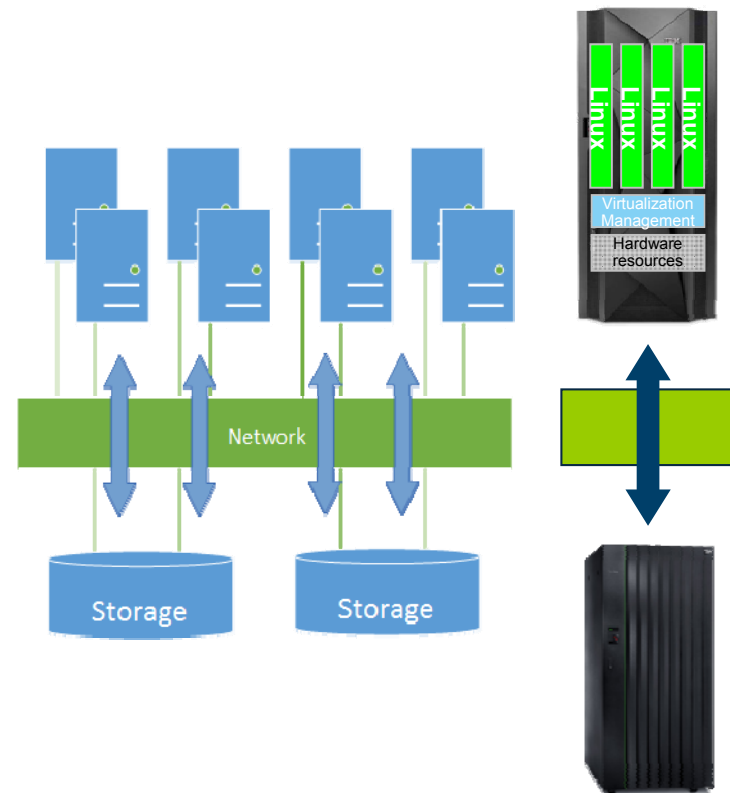
IBM Spectrum Storage for Linux on z Systems – Version 4.1

- **Express Edition of IBM Spectrum Storage 4.1** will be the base for the Linux on z Systems support

    Express Edition: Contains the base IBM Spectrum Storage functions

- **Content comprises:**

    Express Edition with base IBM Spectrum Storage functions

    Linux instances in LPAR mode or on z/VM (on the same or different CECs)

    Up to 16 cluster nodes (same or mixed Linux distributions/releases)

    Support for ECKD™-based storage and FCP-based storage
        DS8000 , IBM Storwise v7000, IBM XIV, IBM FlashSystem

IBM Spectrum Storage for Linux on z Systems – Version 4.1 (cont.)

- **Minimum supported Linux distributions:**
    - SUSE Linux Enterprise Server (SLES) 11 SP3 + Maintweb-Update
    - Red Hat Enterprise Linux (RHEL) 6.5 + Errata Update

While IBM Spectrum Storage V4.1 for Linux on z Systems does not support all functionality available for other platforms, this gap will be closed with updates.

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IBM Spectrum Storage for Linux on z Systems – V4.1.1

- Announced May 11, 2015

- Generally available mid-June 2015

- Adds a Standard Edition option to the existing Express Edition (V4.1)

  – Information Life Cycle Management (ILM)

  – Synchronous Active File Management (AFM)

  – Support for all hardware using ECKD DASD

  – Stretched cluster with synchronous mirroring utilizing block-level replication with distances of less than 40 km

  – Support for increased number of nodes (from 32 to 128)

IBM Spectrum Storage for Linux on z Systems – V4.1.1 (Cont.)

- Supported Linux on z Systems Releases
- Red Hat Enterprise Linux
  - 7.1 or higher
  - 6.5 or higher
- SUSE Linux Enterprise Server
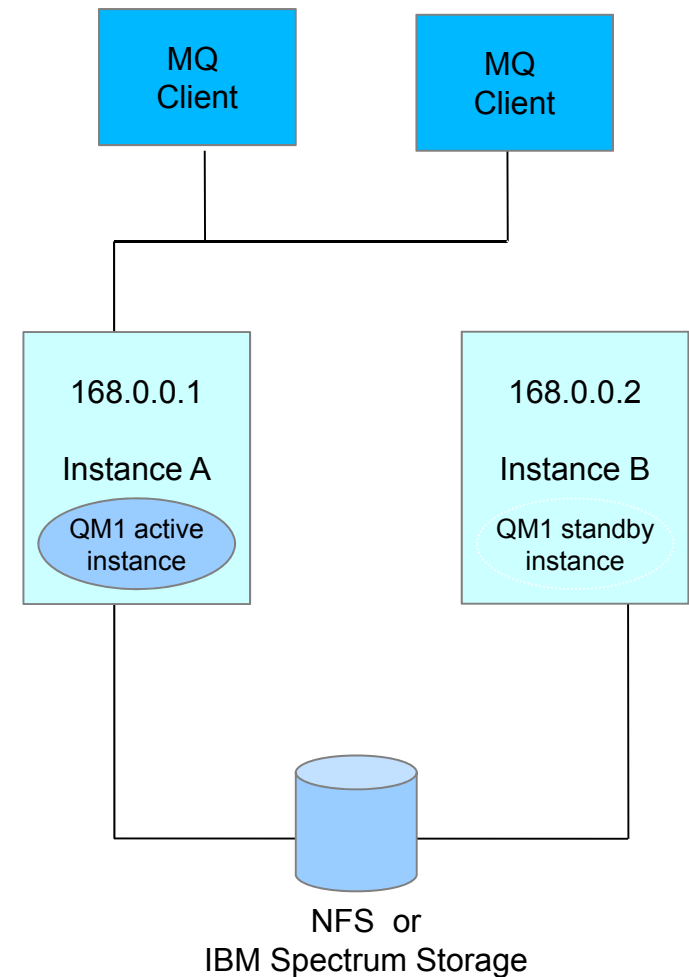 - 12 or higher
  - 11 SP3 or higher

Use Case for WebSphere MQ
Multi-Instance Queue Manager (MIQM)

High availability configuration of WebSphere MQ with two instances of the queue manager running on different servers, and either instance can be active.

A shared file system is required on networked storage, such as a NFS, or a cluster file system such as **IBM Spectrum Storage**

MQ Client

MQ Client

168.0.0.1

Instance A

QM1 active instance

168.0.0.2

Instance B

QM1 standby instance

NFS or
IBM Spectrum Storage

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Use Case for WebSphere MQ (cont.)
Multi-Instance Queue Manager (MIQM)

- **Advantages of IBM Spectrum Storage versus NFS**

    No single-server bottleneck

    No protocol overhead for data (network) transfer

    Interacts with applications like a local file system, while

    delivering high performance, scalability and fault tolerance by allowing data access from multiple systems directly and in parallel

    Maintaining file-data integrity while allowing multiple applications / users to share access to a single file simultaneously

Lab Environment
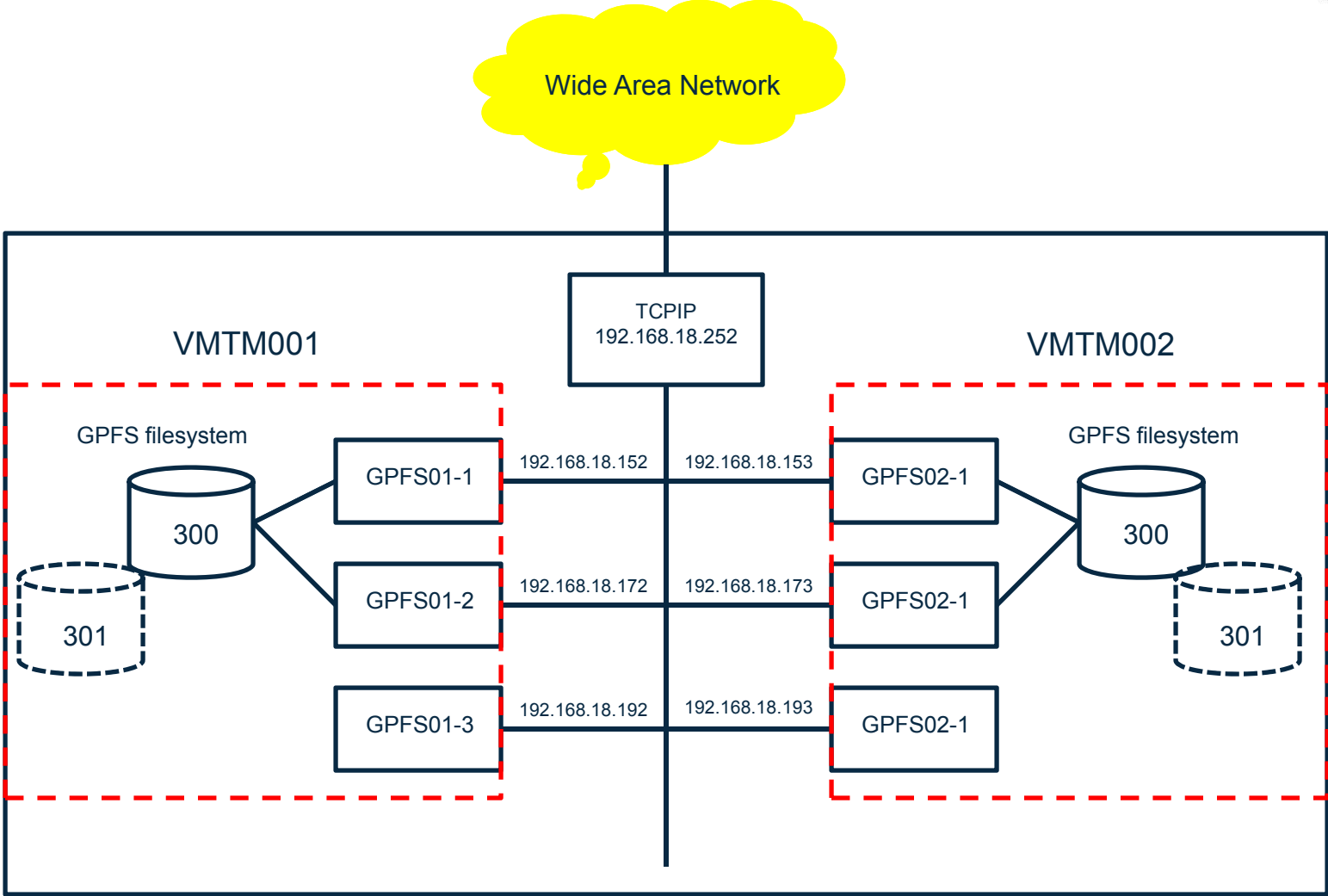
Team IP Addresses

Team #	GPFSxx-1	GPFSxx-2	GPFSxx-3
01	192.168.18.152	192.168.18.172	192.168.18.192
02	192.168.18.153	192.168.18.173	192.168.18.193
03	192.168.18.154	192.168.18.174	192.168.18.194
04	192.168.18.155	192.168.18.175	192.168.18.195
05	192.168.18.156	192.168.18.176	192.168.18.196
06	192.168.18.157	192.168.18.177	192.168.18.197
07	192.168.18.158	192.168.18.178	192.168.18.198
08	192.168.18.159	192.168.18.179	192.168.18.199
09	192.168.18.160	192.168.18.180	192.168.18.200
10	192.168.18.161	192.168.18.181	192.168.18.201
11	192.168.18.162	192.168.18.182	192.168.18.202
12	192.168.18.163	192.168.18.183	192.168.18.203
13	192.168.18.164	192.168.18.184	192.168.18.204
14	192.168.18.165	192.168.18.185	192.168.18.205
15	192.168.18.166	192.168.18.186	192.168.18.206
16	192.168.18.167	192.168.18.187	192.168.18.207
17	192.168.18.168	192.168.18.188	192.168.18.208
18	192.168.18.169	192.168.18.189	192.168.18.209
19	192.168.18.170	192.168.18.190	192.168.18.210
20	192.168.18.171	192.168.18.191	192.168.18.211

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