

XtreemOS



*Enabling Linux
for the Grid*

XtreemOS Configuration Testbed Deployment

Yvon Jégou

INRIA-Rennes, France

2010 XtreemOS Summer School





Service Support in XtreemOS

- **Where to deploy a service?**
- **How do clients locate the services?**
 - Defined in a configuration file of each client node
 - Through a directory service
 - Through DIXI, the XtreemOS system bus
- **How do clients communicate with services?**
 - Defined in a configuration file of each client node
 - Through DIXI, the XtreemOS system bus





3 sets of Services

- **VO, user and resource management**
- **Data management**
- **Application management**





- **4 services**
 - XVOMS
 - VO management data base
 - Accessed only by CDA and VOLifecycle
 - CDA
 - cCertificate distribution authority
 - RCA
 - Resource certification authority
 - VOPS
 - Virtual Organisation Policy Service



VO management interfaces

- **XVOMS**
 - Accessed only by CDA and VOLifecycle
- **CDA**
 - Accessed through VOLifecycle web front-end
 - Accessed through CDA client from nodes
- **RCA**
 - Connected to the DIXI bus
- **VOPS**
 - Connected to the DIXI bus



- **XtreemFS**
 - Grid file system
- **3 types of services**
 - DIR
 - Directory service
 - MRC
 - Meta data services
 - OSD
 - Object storage services



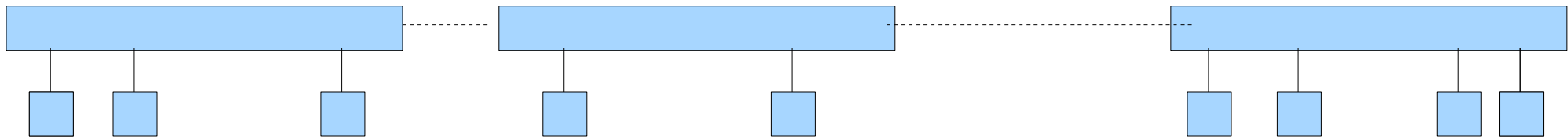


- **DIR service**
 - Client side (address) configured everywhere
- **MRC service**
 - Client side (address) configured everywhere a volume can be created (all resource nodes in XtreemOS)
- **OSD service**
 - No client side configuration





- **All AEM services connected to the DIXI bus**



- **Single instance**
 - JobDirectory, ReservationManager, ...
- **Multiple instances**
 - ResMng?
- **Present on all resource nodes**
 - SRDSMng



- **Server side**
 - Need to be configured on the nodes running the service
- **Client side**
 - No configuration on client side
 - Services located through DIXI



Need for a configuration tool

- **Configuration process is complex**
 - Configure each node
- **Reconfiguration is even more complex**
 - Moving services
- **Xosautoconfig tool**





- **Basic idea**
 - Define a single configuration for the whole grid
 - Replicate this configuration on all nodes
 - Run **xosautoconfig** on all nodes
- **Result**
 - Coherent configuration of the whole grid
- **Reconfiguration of the grid**
 - Modify the configuration
 - Replicate
 - Rerun **xosautoconfig**



Xosautoconfig configuration

- **Three files**
 - Global variables
 - Node types
 - Service distribution
- **Service configuration file templates**
 - Reproduce `/etc/xos` and `/root/.xos` folders





- **File** globalDefs

```
GLOBALVOPSIP=131.254.201.16
SCALARISBOOTIP=131.254.201.16
OWBOOTSTRAPIP=131.254.201.16
RSSBOOTSTRAPIP=131.254.201.16
DIXIROOTHOST=paraxos1.irisa.fr
DIXIROOTIP=131.254.201.16
DIRHOSTIP=131.254.201.16
MRCHOSTIP=131.254.201.16
OSDHOSTIP=131.254.201.16
USESSL=false
```



- **File nodeTypes**

head-node: paraxos1.irisa.fr

resource-node: paraxos2.irisa.fr \
paraxos3.irisa.fr paraxos4.irisa.fr

default-node-type: resource-node



Service configuration, file services

```
head-node: JobDirectory JobMng RCAServer ResAllocator ReservationManager ResMng VOPS
head-node: ExecMng RCAClient ResAllocator ResourceMonitor SRDSMng
core-node: VOLife xvoms cdaserver
core-node: JobDirectory JobMng RCAServer ResAllocator ReservationManager VOPS
core-node: cdaclient
core-node: xtreamfs-dir xtreamfs-mrc xtreamfs-osd
core-node: ExecMng RCAClient ResAllocator ResourceMonitor SRDSMng ResMng
core-node: amsd nsspam openssh xtreamos-openssh ntp xtreamfs-client

# head-node: VOLife xvoms cdaserver cdaclient
head-node: cdaclient
head-node: xtreamfs-dir xtreamfs-mrc xtreamfs-osd
head-node: amsd nsspam openssh xtreamos-openssh ntp xtreamfs-client

resource-node: ExecMng RCAClient ResAllocator ResourceMonitor SRDSMng ResMng cdaclient
resource-node: amsd nsspam openssh xtreamos-openssh ntp xtreamfs-client

all-nodes: CronDaemon DaemonGlobal XMLExtractor
```





Service configuration file templates

- **Templates**
 - Each service configuration file can have a template in `/etc/xos/xosautoconfig/conf`
- **Example for DIXI bus**
 - **Config file in `/etc/xos/config/XOSdConfig.conf`**
 - **Templance in `/etc/xos/xosautoconfig/conf/etc/xos/configXOSdConfig.conf`**





XOSdConfig.conf

```
[yvon@paraxos1 config]$ cat XOSdConfig.conf
rootaddress.host=paraxos1.irisa.fr
useSSL=false
trustStore=/etc/xos/truststore/certs/
privateKeyLocation=/etc/xos/truststore/private/resource.key
trustStoreSSL=/etc/xos/truststore/certs/
externalAddress=131.254.201.16
networkInterface=eth0
services.size=17
rootaddress.externalAddress=131.254.201.16
certificateLocation=/etc/xos/truststore/certs/resource.crt
[yvon@paraxos1 config]$
```





Xosautoconfig steps

- **Step 1**
 - Stop all services
- **Step 2**
 - Update the templates using the global variables
- **Step 3**
 - Update config files using template files
- **Step 4**
 - Configure services to be started at boot
 - Restart services



When should you run xosautoconfig

- **After installing an ISO**
 - First update configuration file
 - And replicate (tgz of /etc/xos/xosautoconfig/conf)
- **After cloning a VM**
 - To adapt to new IP address
- **After installing a VM from our site**
 - If IP change
 - Note: MAC address change can introduce problems





XtreemOS open testbed

- **VOLife, XVOMS and CDA at STFC (UK)**
- **Other core services on paraxos1 at INRIA (France)**
- **Resource nodes at INRIA (France), CNR (Italy), Ulm and Dusseldorf (Germany), VUA (The Netherlands)**

