Backup and Recovery of the X1 Complex Internal Machines at the ARSC

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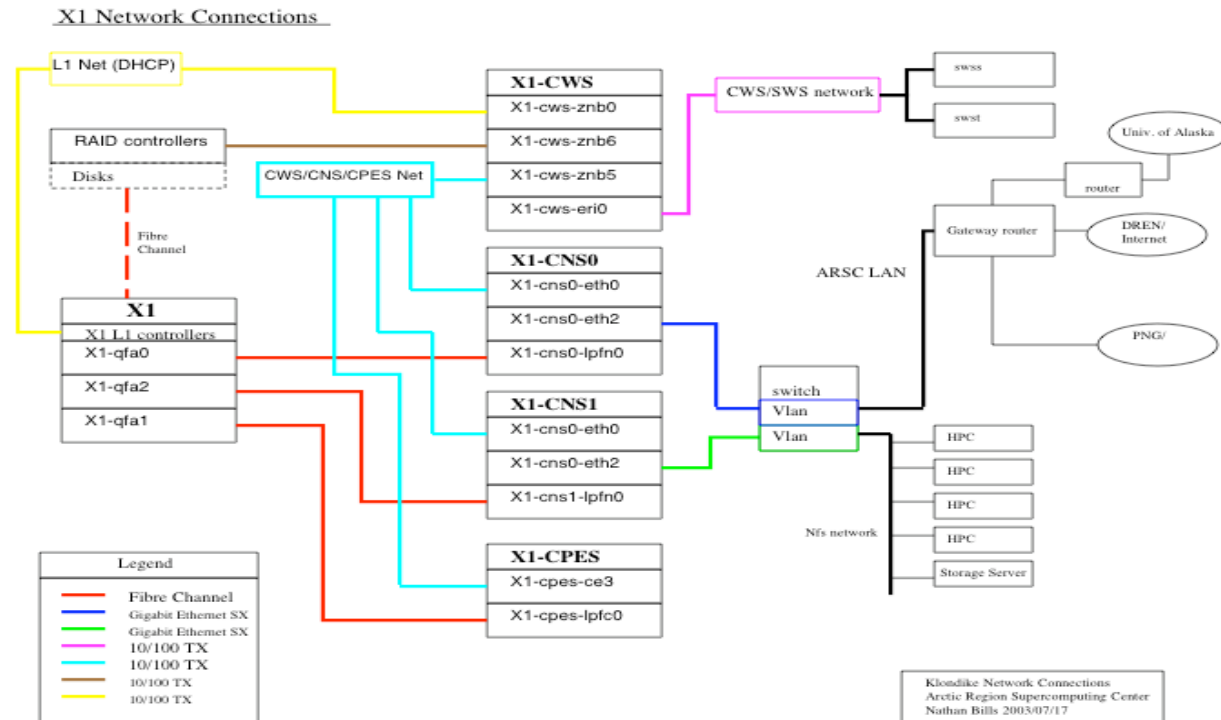
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How to Discover Recovery is Required

- **Break something**

- **Break something important**

- **Unwittingly make changes which don't work out and from which you cannot recover**

- **Plan ahead**

ARSC X1

- **X1, CWS, CPES, CNS = X1 Complex**

Why Modify The X1 Complex

- **Maintain Traditional User Environment**

- **Maintain Existing Security Procedures**

- **Meet External Security Requirements**

ARSC Traditional Environment

- **X1 Immediate Predecessors - SV1 and T3E**

- **Migrated User Set**

- **Management and Reporting Tools**

- **/usr/local Used for Installed Product Libraries**

Existing Security Procedures

- **Reduced SUID/SGID Set**

- **File Change Tracking**

- **Command Line Reporting on the Internal Machines**

- **Openssh for Intersystem Communication**

External Security Requirements

- **Department of Defense High Performance Computing Program (DOD HPCMP)**

- **Comprehensive Security Assessment (CSA)**

- **DOD Information Assurance Vulnerability Alerts, Bulletins, and Technical Advisories**

External Security Requirements CSA

- Evaluated as if Each Machine is a Stand-alone Machine
- Immediate Change Permissions, Removed Products, Patches
- Additional Products Mean Additional Exposure - CNS For Instance

External Security Requirements IAVA

- **Immediate Vulnerability Alert**
- **Requires Immediate Action**
- **Not Correcting Could Mean No Operation**

How Long to Recover

- **Too Long if a Restore is Required**

- **Change Complexity Means Too Long if No Backup**

Fast Recovery

- **Bootable Clone**

- **Vfstab (fstab) to Boot in Place**

- **CNS Alternate Root Partition**

- **How Often?**

Repair and Resume

- **Scheduled Recovery Period**

- **Can be Used in the Event of Disk or Machine Replacement**

- **Can Provide File Level Recovery**

- **Migrated to CWS and to Tape**

CNS Dump Reboot

- **Three Root Partitions**
- **Used for Cray Updates**
- **Cloned Root Partition**
- **Dumped /var, /boot, and /**
- **LILO Boot Prompt Entry for Alternate Root**

CNS Restore

- **Untested as yet**
- **Single Disk**
- **System Failure - Use Old Disk**
- **Partition Failure - Boot From Clone and Restore Primary**
- **Disk Failure - Restore From Install Materials and Rebuild From Dump**
- **Will Require Restore of Alternate Root and Reboot to Restore Primary Root**
- **/boot and /var from Dumps**

CPES Dump Reboot

- **Cloned Primary Disk with Modified vfstab**
- **Immediate Boot Using telnet from CWS by Specifying Boot from Clone.**
- **CPES PE Environment Recovery by Mounting PE Clone**

CPES Restore

- **Not Yet Tested**
- **Bad Disk - Boot From Clone and Restore from Dumps**
- **Bad Machine - Use Old Disks**
- **Bad External Disk Unit - Use Old Disks**
- **Bad Clones - Install New Disk and Clone**
- **Need Further Info On Sun Disk Replacement**

CWS Dump Reboot

- **CWS - single disk**
- **Cloned Primary Disk with Modified vfstab**
- **Problem with X1 Control and Shutdown**
- **Boot From Clone Using Boot Prompt Alternate Disk**
- **Dump File Systems to Tape Including CPES and CNS**

CWS Restore

- **Not Yet Tested**
- **Bad Disk - Boot From Clone and Restore from Tape Dump**
- **Bad Machine - use alternate CWS and Install Old Disks**
- **Bad Clone Disk - Install New Disk and Clone**

Summary

- **Internal and External Requirements**
- **Recover Quickly - Cloned Disks**
- **Schedule Repair - Restore From Dumps**
- **Old Disks to New Machines**

Do They Work?

- **Still testing to be done.**

- **Difficult to try in a production environment.**

- **Preplanning will at least provide a frame for the recoveries we will have to make when it really breaks.**

Thank You For Your Time

- Questions?
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