6,716 active courses in the Autumn 2014
Service restored Friday 7:30pm
Extra 8-Help staff midnight + weekend
Stats
- Fri-Wed Carmen logins: 548,142
- Fri-Wed Help Tickets (relatively normal)
  - 83 Requests, 92 incidents
  - Response within 30 minutes
  - 70% cache or standard Carmen questions
22M files were restored from DR backup

Total files that were missing from Nov 3-8: 72,315

DropBox files recovered: 53,000K (all but 170)

News items files recovered: 499 (all but 38)

Discussions files recovered: 1,778 (all files recovered)

Continuing to restore this week:

Instructor Feedback (4,345) / Group Submissions (1083)
WHY MID-SEMESTER?

Maintenance Rationale

- Storage and computing needs are continually evaluated for the Carmen system.
- Carmen had reached a critical limit on storage (94.6 percent consumed)
- Necessary to ensure there was sufficient space for the remainder of the Autumn semester.
Only the file servers were affected.

File servers = more than 22M Carmen files, 14.6TB of data.

Backup system can restore files at a rate of 120-140GB/hr.

14540.8 GB / 120 GB/hr = 121 hours (5 days)

Testing & rebuilding steps necessary once all of the files were restored.

Multiple recovery paths were pursued concurrently.
CONTINGENCY PLANNING

Carmen System Structure
Can faculty trust Carmen?

- Carmen has an uptime of better than 99.99% each year.
- The 3-year average is: 99.995%
  
  With the exception of last week, 2 times when Carmen was unavailable due to external factors.

  - 1/18/2012: underlying network issue affecting most OSU services, 45 minutes
  - 10/17/2014: underlying network issue affecting most OSU services, 36 minutes
Can faculty trust Carmen?

<table>
<thead>
<tr>
<th>Availability %</th>
<th>Downtime per year</th>
<th>Downtime per month</th>
<th>Downtime per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% (&quot;one nine&quot;)</td>
<td>36.5 days</td>
<td>72 hours</td>
<td>16.8 hours</td>
</tr>
<tr>
<td>95%</td>
<td>18.25 days</td>
<td>36 hours</td>
<td>8.4 hours</td>
</tr>
<tr>
<td>97%</td>
<td>10.96 days</td>
<td>21.6 hours</td>
<td>5.04 hours</td>
</tr>
<tr>
<td>98%</td>
<td>7.30 days</td>
<td>14.4 hours</td>
<td>3.36 hours</td>
</tr>
<tr>
<td>99% (&quot;two nines&quot;)</td>
<td>3.65 days</td>
<td>7.20 hours</td>
<td>1.68 hours</td>
</tr>
<tr>
<td>99.5%</td>
<td>1.83 days</td>
<td>3.60 hours</td>
<td>50.4 minutes</td>
</tr>
<tr>
<td>99.8%</td>
<td>17.52 hours</td>
<td>86.23 minutes</td>
<td>20.16 minutes</td>
</tr>
<tr>
<td>99.9% (&quot;three nines&quot;)</td>
<td>8.76 hours</td>
<td>43.8 minutes</td>
<td>10.1 minutes</td>
</tr>
<tr>
<td>99.95%</td>
<td>4.38 hours</td>
<td>21.56 minutes</td>
<td>5.04 minutes</td>
</tr>
<tr>
<td>99.99% (&quot;four nines&quot;)</td>
<td>52.56 minutes</td>
<td>4.32 minutes</td>
<td>1.01 minutes</td>
</tr>
<tr>
<td>99.995%</td>
<td>26.28 minutes</td>
<td>2.16 minutes</td>
<td>30.24 seconds</td>
</tr>
<tr>
<td>99.999% (&quot;five nines&quot;)</td>
<td>5.26 minutes</td>
<td>25.9 seconds</td>
<td>6.05 seconds</td>
</tr>
<tr>
<td>99.9999% (&quot;six nines&quot;)</td>
<td>31.5 seconds</td>
<td>2.59 seconds</td>
<td>604.8 milliseconds</td>
</tr>
<tr>
<td>99.99999% (&quot;seven nines&quot;)</td>
<td>3.15 seconds</td>
<td>262.97 milliseconds</td>
<td>60.48 milliseconds</td>
</tr>
<tr>
<td>99.999999% (&quot;eight nines&quot;)</td>
<td>315.569 milliseconds</td>
<td>26.297 milliseconds</td>
<td>6.048 milliseconds</td>
</tr>
<tr>
<td>99.9999999% (&quot;nine nines&quot;)</td>
<td>31.5569 milliseconds</td>
<td>2.6297 milliseconds</td>
<td>0.6048 milliseconds</td>
</tr>
</tbody>
</table>
Carmen Roadmap – AU14-SP15

- **Beginning Yearly Carmen Updates (May 2012)**
- **Move to continuous SAN Backups (Jan 2013)**
- **Yearly Update (May 2013)**
- **Integration w/ TurnItIn, Mediasite, Pearson (2013)**
- **Yearly Update (May 2014)**
- **OSU Mobile Carmen Grades (Fall 2014)**

**FUTURE**

- **SOCC Move (June 2015)**
- **Hardware Upgrade (July 2015)**
- **Install D2L Insights (Advanced Analytics) (Summer 2015)**
- **Wiggio integration (Fall 2015)**
- **Mediasite Integration (Spring 15)**
- **Yearly Update (May 2016) 10.4 continuous updates**
Upcoming Activities

- Near-term: service is stable through AU14.
- Additional Steps added to move to production and back out plans
- Additional enhancements timed with move to new Data Center.
- The LMS Evaluation committee is being established.
  - The expected timeline Spring semester 2015, with a report at the end of May 2015.
  - Many of the people who will be running this project are on the RIV Replacement project, which will wrap at the end of December.
- Root Cause Analysis with CoDELIT
8-Help Requests Since Friday 11/14

- FRI 11/14 6pm-Midnight, 15 calls (zero after 10:30pm)
- SAT 11/15 42 calls - (15 after 5pm)
- SUN 11/16 88 calls - (24 before 3pm, 7 after 8pm)
- Friday – Monday: 99 requests/incidents:
  - Cache issues: 68
  - Missing files: 22
  - Other (regular Carmen questions): 9
Carmen Go Live preparation

KRC - TNC

Below: The Offline-Ready Carmen 04 server is loaded and available to be connected to the network and SAN Storage should there be failure of the primary Carmen File Server.

Below: The Carmen QA Environment at KRC will be kept in place until the teams determine it is not needed.

Right: The Carmen Snap copy will be used as Storage backup until the new DR Environment is available at TNC.

Environments set up and populated After Go Live

NEW DR STORAGE 18TB

NEW CARMEN SNAP COPY

Above: The Carmen and Server teams will collaborate next week to determine the best time and layout for the "rebuild QA and DR at TNC."
Daily Change Report for November 9

<table>
<thead>
<tr>
<th>Number</th>
<th>Service</th>
<th>Technical domain</th>
<th>Short description</th>
<th>Assigned to</th>
<th>Type</th>
<th>Disruption</th>
<th>Planned start date</th>
<th>Planned end date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHG0011684</td>
<td>Call Center Services</td>
<td>Server - Physical</td>
<td>Moving 13 servers from KRC to SOCC (Move #3)</td>
<td>hamilton 215</td>
<td>Major</td>
<td>No outage</td>
<td>2014-11-09 08:00:00</td>
<td>2014-11-09 16:00:00</td>
</tr>
<tr>
<td>CHG001172</td>
<td>Camren (LMS)</td>
<td>Application</td>
<td>Updates to Alpha - Primarily in Portal Event widget, but offers upgrades as well</td>
<td>nethis.1</td>
<td>Minor</td>
<td>Outage in agreed window</td>
<td>2014-11-09 00:00:00</td>
<td>2014-11-09 03:00:00</td>
</tr>
<tr>
<td>CHG001192</td>
<td>Camren (LMS)</td>
<td>Server - Physical</td>
<td>Extend UI drive on CAMREN Prod FS by 4 TB</td>
<td>bourne.1</td>
<td>Minor</td>
<td>Outage in agreed window</td>
<td>2014-11-09 00:00:00</td>
<td>2014-11-09 03:00:00</td>
</tr>
<tr>
<td>CHG0011823</td>
<td>Camren/Connect (Web Conferencing)</td>
<td>Server - Physical</td>
<td>Update Apache and PHP on Camren/Connect servers</td>
<td>groeniger.3</td>
<td>Minor</td>
<td>Outage in agreed window</td>
<td>2014-11-09 02:00:00</td>
<td>2014-11-09 05:00:00</td>
</tr>
<tr>
<td>CHG0011684</td>
<td>Data Center Networking</td>
<td>Network Administration</td>
<td>Firewall interface MAC addresses need reconfigured to fix error on router</td>
<td>tanelo.1</td>
<td>Minor</td>
<td>Outage in agreed window</td>
<td>2014-11-09 02:30:00</td>
<td>2014-11-09 04:00:00</td>
</tr>
<tr>
<td>CHG0011978</td>
<td>Human Resource Applications</td>
<td>Server - Virtual</td>
<td>Migrate FTP/SSFTP LDAP auth to essential servers</td>
<td>romas.3</td>
<td>Minor</td>
<td>Outage in agreed window</td>
<td>2014-11-09 01:00:00</td>
<td>2014-11-09 03:55:03</td>
</tr>
<tr>
<td>CHG0011999</td>
<td>Web Single Sign On</td>
<td>Middleware Administration</td>
<td>Disable SSL on webauth service Ohio website</td>
<td>candeo.2</td>
<td>Minor</td>
<td>No outage</td>
<td>2014-11-09 09:00:00</td>
<td>2014-11-09 09:30:00</td>
</tr>
</tbody>
</table>

Run by: James Scott Johnson
Change Plan
Change Plan (cont’d)

**Change Plan: Split R1:R2, write signatures to new disks, add new disk to volume group, extend file system**

**Description:**
ODEE has requested an additional 2 TB for the production file server (U: drive)

**Planned end date:** 2014-11-09 03:00:00
**Priority:** 4 - Standard
**Planned start date:** 2014-11-09 00:00:00
**Type:** Minor
**Change state:** Submitted

### Related Links
Show workflow

### Change Tasks

<table>
<thead>
<tr>
<th>Number</th>
<th>Short description</th>
<th>State</th>
<th>Assigned to</th>
<th>Actual work start</th>
<th>Actual work end</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTASK53211</td>
<td>Build RFC - Extend U; drive on CARMEN Prod FS by 2 TB</td>
<td>Closed Complete</td>
<td>bourne 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTASK53696</td>
<td>Release RFC - Extend U; drive on CARMEN Prod FS by 2 TB</td>
<td>Closed Complete</td>
<td>bourne 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTASK53775</td>
<td>Post Implementation Review - Extend U; drive on CARMEN Prod FS by 4 TB</td>
<td>Open</td>
<td>bourne 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
File Scan Process (CHKDSK)

Started Monday 11/10, ran for 7 days
COMMUNICATION TIMELINE

CONTINUOUS – Twitter, Facebook, Reddit, email monitoring responses to concerned constituents

SUN NOV 9
4:40 AM System Status Update
9:09 AM First Twitter notification
9:23 AM Active Twitter monitoring/support begins
1:10 PM Re: [CA News] Carmen Offline - 11/9/2014
7:37 PM Outage announcement + link to system status page, added to Carmen landing page
8:10PM System Status Updated
8:51 PM Re: [CA News] Carmen Offline - 11/9/2014

MON NOV 10
8:35 AM Carmen Outage article posted to odee.osu.edu
11:36 AM [CA News] Alpha processing during Carmen downtime
9:03 AM University-Wide Email from Mike Hofherr (by audience, through 9:45)
5:22 PM Workaround Article Published to odee.osu.edu
12:00PM System Status Update
5:45PM System Status Update

TUES NOV 11
8:38AM System Status Update
10:00AM Hofherr interview with Lantern reporter
2:00PM System Status Update
11:31 AM [CA News] Carmen Quizzes
9:00PM System Status Update
COMMUNICATION TIMELINE

CONTINUOUS – Twitter, Facebook, Reddit, email monitoring responses to concerned constituents

**WED NOV 12**
9:12AM System Status Update
8:09 AM OnCampus Today announcement
11:31 AM [CA News] Carmen Quizzes
1:00PM System Status Update
1:30PM Hofherr Interviewed by Lantern TV
3:32 PM - [CA News] FW: Summary of Carmen functional test
5:45PM System Status Update
9:10PM System Status Update

**THURS NOV 13**
7:30AM System Status Update
10:14 AM Carmen Restore FAQs posted to odee.osu.edu
10:32 AM Carmen Update - All-university email from Joseph Steinmetz
1:15PM System Status Update
9:00PM System Status Update

**FRI NOV 14**
4:08 PM Carmen Recovery article published to odee.osu.edu
4:25PM University Leadership Notified of Carmen Recovery
4:25PM IT Leadership Notified of Carmen Recovery
4:45PM System Status Restore Announcement Update
4:45PM Tweet (Carmen online tonight)
5:04 PM All-University Status Update on Carmen from Mike Hofherr
7:10PM Resolution notification (from button on System Status Page)