Update on Desktop Virtualization at MCC

A Key Part of the 2013-2016 Technology Master Plan
Desktop Virtualization Update

► A Look Back:
  ▪ Why did we launch a Desktop Virtualization Strategy back in 2011?

► Progress To-Date

► Where do we go from here?
What Triggered a Desktop Virtualization Strategy?

**In 2010:**

- Escalating number of desktop computers leased year after year:
  - 2009: 360 units
  - 2010: 454 units
  - 2011: 590 units (Includes 135 Thin Clients: *Desktop Virtualization Begins*)
  - 2012: 410 units (Includes 100 Thin Clients)
  - 2013: 668 units (Includes 200 Thin Clients)
  - 2014: 459 units (No Thin Clients added)

- Poor ability to securely access MCC work data remotely
  - Use of flash/thumb drives to transport files to/from campus

- Increasingly long login times
  - Often 5+ minutes in the classroom

- Increasing IT administrative overhead due to growing numbers

- Increasing energy/power requirements
Current MCC Desktop Computing Architecture

MCC Network

MCC "Fat" PC
- 1 Gbps/Copper
- (~$650/PC)

(Profile downloaded to PC at Login)

MCC Network
- 1 Gbps/Copper
- 10 Gbps/Fiber

Profile Server (Logins)
- 40 Gbps/Fiber

Storage Area Network (H: Drive)
- Data stored in MCC Data Center

Internet
- 100 Mbps
- 10 Gbps/Fiber
- 40 Gbps/Fiber

Network Speed Comparison
- 10 Gbps = 100 Lanes
- 1 Gbps = 10 Lanes
- 100 Mbps = 1 Lane

Presented at the 12/11/2012 Committee of the Whole

McHenry County College
New Virtual Desktop Computing Architecture

3-Year Implementation = 30% – 40% penetration (450 – 600 workstations)

MCC Network

1 Gbps/Copper

40 Gbps/Fiber

1 Gbps/IBOP

“Streaming” software applications to any device, anywhere/anytime

10 Gbps = 100 Lanes
1 Gbps = 10 Lanes
100 Mbps = 1 Lane

NETWORK SPEED COMPARISON

Investment Transfer

Thin Client (~$259)
(8-10yr MTBF)
(78% Energy Savings)

“AppSense” Profile Server (Logins)

Citrix Server Farm
XenDesktop
XenApp

Storage Area Network
( H: Drive )

STUDENTS

SmartPhone
( ~$259 )
(8-10yr MTBF)
(78% Energy Savings)

Tablets

Internet

Presented at the 12/11/2012 Committee of the Whole

McHenry County College
“Fat” Clients versus Thin Clients

Power Consumption Data

S Class Thin Client
Smallest, most economical model

V Class Thin Client
Most powerful model

Low-end PC
Mid-range PC
High-end PC

Watts/Hour

Minimum
(unit operating and idle with minimum number of peripheral devices connected)

Maximum
(unit operating with all peripheral ports loaded to the maximum regulation limits)

(.004 cents)

(.0013 cents)

(.0077 cents)

(.018 cents)

(.0347 cents)

(.0175 cents)

(.1079 cents)

(.1560 cents)

(.2407 cents)

(.0004 cents)

(12/11/2012 Committee of the Whole)
“Fat” Clients versus Thin Clients

Power Consumption (KWH per Year)
12 Hours/Day * 200 Days/Year * 100 Computers

78% Savings
Total Client Workstations at MCC

Supported Clients in a Given Year by Client Type (2010 - 2015)
Why Have Total Client Workstations Grown?

Mac Client Footprint (2010 - 2015)

- Mac-Laptop
- Mac-Desktop
- Linear (Mac-Laptop)
- Linear (Mac-Desktop)

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>Mac-Laptop</th>
<th>Mac-Desktop</th>
<th>Linear (Mac-Laptop)</th>
<th>Linear (Mac-Desktop)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>6</td>
<td>85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>11</td>
<td>84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>11</td>
<td>88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>14</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>54</td>
<td>140</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why Have Total Client Workstations Grown?

Windows Workstation Footprint (2010 - 2015)

- **Win-WkStation**
- Linear (Win-WkStation)

![Graph showing the growth of Windows Workstation Footprint from 2010 to 2015.]
### Six-Year Cost Comparison of Desktop Virtualization (DTV) Strategy vs No Virtualization - SUMMARY

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>(Current) Year 5</th>
<th>Year 6</th>
<th>6-Year Total Cost</th>
<th>6-Year NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of No Virtualization</td>
<td>$451,629.90</td>
<td>$472,330.10</td>
<td>$512,751.48</td>
<td>$426,905.99</td>
<td>$353,167.05</td>
<td>$524,766.00</td>
<td>$2,741,550.52</td>
<td>$2,523,611.50</td>
</tr>
<tr>
<td>DTV Strategy Costs</td>
<td>$377,362.56</td>
<td>$700,038.23</td>
<td>$521,641.32</td>
<td>$183,087.00</td>
<td>$224,094.00</td>
<td>$317,747.00</td>
<td>$2,323,970.11</td>
<td>$2,161,200.72</td>
</tr>
</tbody>
</table>

DTV Strategy Includes These Annual Power Savings:

- Year 1: -$22,113.00
- Year 2: -$38,493.00
- Year 3: -$71,253.00
- Year 4: -$71,253.00
- Year 5: -$71,253.00
- Year 6: -$345,618.00

**Total 6-Year Power Savings**:

- 6-year Savings : $417,580.41
- 6-year NPV Savings : $362,410.78

### Yearly Cost Comparison of Virtualization vs. No Virtualization

#### List of Costs in Calculations

<table>
<thead>
<tr>
<th>No Virtualization</th>
<th>Desktop Virtualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat Client Purchases</td>
<td>Fat &amp; Thin Client Purchases</td>
</tr>
<tr>
<td>Client Software Costs</td>
<td>Client Software Costs</td>
</tr>
<tr>
<td>Data Center Costs Include:</td>
<td>Data Center Costs Include:</td>
</tr>
<tr>
<td>Server Hardware</td>
<td>Server Hardware</td>
</tr>
<tr>
<td>Data Storage Hardware</td>
<td>Data Storage Hardware</td>
</tr>
<tr>
<td>Networking Hardware</td>
<td>Networking Hardware</td>
</tr>
<tr>
<td>Additional Labor Costs</td>
<td></td>
</tr>
</tbody>
</table>

#### Thin Client vs Fat Client Power Savings Calculations

- Average Hours Used per Week
- Number of Weeks Used per Year
- Average Watts Used per Hour
- Annual Fat Client per Unit Electrical Cost
- Annual Thin Client per Unit Electrical Cost

#### Other "Soft" Benefits of Virtualization

- Greater flexibility to deploy clients anywhere, anytime
- Reduced IT administrative overhead
- Quicker support response times
- Lower labor costs