How Application Virtualization improved the end user IT experience at Odisee University College

Jan Van Calster
Odisee, Belgium
About Odisee

• University College, Belgium
• 4 major campuses (Brussels, Ghent, Aalst, Sint Niklaas)
• 25 programs, 6 departments
• 28 postgraduate programs
• 11000 Students, 1100 Staff
• Services for KULeuven (KULeuven):
  – 2 campuses
  – 4 Faculties
  – 7000 Students
  – 750 Faculty members and Staff
About Odisee

Campus Ghent
- Odisee: 2050 Students
- KULeuven: 1350 students

Campus Aalst
- Odisee: 2090 Students

Campus Waas
- Odisee: 1450 Students

Campus Brussels
- Odisee: 4800 Students
- KULeuven: 4500 students
Who is Jan Van Calster

- Teaching at Bachelor and Master level: Programming languages, Operating systems, Networking (1984-2005)
- Head of the ICT services department of EHSAL and HUBrussel (2005-2013)
- ICT Servicedesk Manager Odisee (2013-now)
- Jan.VanCalster@odisee.be
What was our problem?

- A lot of software titles to install (over 140 titles)
  - Very large images
  - SCCM helps, but is not always flexible enough
  - Configuration conflicts
  - Last minute additions, even during the academic year

- Flexible scheduling of computer classrooms
  - Eg. In Brussels: 12 computer classrooms
  - Shared between programs
  - Shared between institutes (Odisee and KULeuven)
What was our problem?

• Public computers
  – Libraries
  – Student facilities (open centers)

• Software licensing
  – How many licenses do we need?
  – Controlling licenses (only some courses need certain titles)
  – Metering (Who is using what and how much?)
  – BYOD: what can we offer to students? (Windows, Mac, .. )
  – Temporary use of software (eg. A teacher needs Camtasia for 2 months)
What are the possible solutions?

- **VDI/Remote Desktop**
  - VMware Horizon (formerly Horizon View)
  - Citrix XenDesktop
  - Microsoft VDI and Remote FX

- **Virtual Workstation**
  - VMware Workstation
  - Microsoft Virtual PC
  - VirtualBox

- **Application Virtualisation**
  - Microsoft App-V 5
  - Numecent Cloudpaging (formerly Application Jukebox)
  - VMware Thin App
What are the possible solutions?

- VDI (VMware, Citrix, Microsoft RDS)
  - Install and run software on a centralised server
  - Plus Points
    - Flexible and OS independent providing there is a client
    - Logical ‘packets’ of titles (eg. Per Program)
    - Lots of competition in the market
    - Lots of existing users (though not many in academia)
What are the possible solutions?

- VDI (VMware, Citrix, Microsoft RDS)
  - Install and run software on a centralised server
  - Minus
    - Very high cost; new hardware and costly client licenses
    - Configuration conflicts still exist
    - Limited interaction with local machine
    - No control over the use of a single application
    - Offline not possible (or not easily possible)
    - Slow with heavyweight apps such as AutoCad, MatLab etc...
    - Still have a large software image without Application Virtualisation
What are the possible solutions?

- Virtual Workstation
  - Virtual OS environment that runs on the local PC
  - Plus Points
    - Controlled environment for BYOD
    - Independant of client OS
  - Minus
    - Not flexible (large image)
    - Distribution on a large scale is not realistic
    - No control over a single application
    - No control over licensing as all part of one master image
What are the possible solutions?

• Application Virtualisation
  – Deliver applications independently

  – Plus Points
    • No (or limited) configuration conflicts
    • No local installation of software
    • Easy addition of new apps to the system

  – Minus
    • Packaging can be sometimes challenging without support from the vendor
    • Limited to Client OS (without emulation)
What are the possible solutions?

- Distribution of the solution
  - VDI/Remote desktop
    - Deploy the client (SCCM, Download, etc)
    - Client is OS specific
  - Virtual Workstation
    - Deploy the virtualisation client (SCCM, Download, etc)
    - Client is OS specific
    - Download the virtual machine (can be quite large)
  - Virtual Application
    - Deploy the apps (SCCM, Download, Stream)
What are the possible solutions?

• Streaming of Virtual Applications (vendor specific)
  – Requirements:
    • Control who can access a virtual application
      (LDAP Authentication, use AD groups and users)
    • Control how many users can run a virtual application simultaneously
      (concurrent licensing)
    • Control how long a virtual application can be used offline
    • Good reporting on the use of virtual applications
What are the possible solutions?

- Distribution of the Virtual Applications (vendor specific)
  - Plus Points
    - Very flexible
      - In Labs
      - In Library
      - On Students on devices
      - On Loan machines
  - Minus
    - First launch takes a little longer (for the initial download)
    - Vendor license restrictions may not allow use on students personal devices
Our Choice

• VDI
  – Ruled out due to the high cost of hardware and licensing
  – Limited implementation to support Mac users

• Remote Desktop (RDP)
  – Ruled out due to inpractical distribution, maybe usable in BYOD or specific situations (exams, certain labs: e.g. giving admin rights to students is a masive no no!)

• Application Virtualisation
  – Ideal as long as the solution has flexible license controls (to adhere to individual software license restrictions)
Our Choice

- [http://www.pqr.com](http://www.pqr.com)
  - Whitepaper: Application Virtualisation Smackdown
- Independent unbiased report on all possible solutions
- Written by industry experts
Our Choice

- Software2 was our preferred solution as it includes:
  - Numecent Cloudpaging
  - Software2 Hub (Self-service AppStore)
Why Software2 and Cloudpaging?

• Configurable virtualisation on a file-by-file level (even allows software with drivers and services to be virtualised)

• Virtual application can contain dependencies (eg. Specific Java runtime, C++, .NET Framework etc)

• Optimized launch (only ~10% of the app needs to be downloaded to start - vastly reducing network traffic)

• Software2 Hub can use AD users and groups to set access rights

• Each virtual app can be distributed in on or offline modes with access controls and customisable time limited access periods

• Good interactive monitoring and reporting tools
Why Software2?

- OEM partner (Software 2)
  - A lot of experience in Higher Education
  - Very good reviews from other users
  - Very good support, only focused on education (mostly Universities and some colleges)
  - Software2 User Day, 2 - 3 times per year (user community sharing experience, best practice and package recipes!)
  - Community knowledge base and library of solutions
  - They package all our freeware apps
  - Training and support for packaging
  - Self-service AppStore
Our Choice

• Additional benefits (not in the original scope)
  – We can provide applications in different languages to our end-users
  – We can provide additional applications to our end-users (since Software2 package all freeware software)
  – Most virtual packages are portable between Windows versions (so upgrading to Windows 10 should be easy – no need for re-packaging)
  – We can run the multiple versions of applications side-by-side, e.g. SPSS 21 and SPSS 22 on the same PC
Our Choice

• To keep in mind

  – Cross platform compatibility still requires additional virtualization (RemoteApp or similar)

  – Requires a client to be installed on the end-user machine
    • This is necessary to keep things under control, but can be distributed by group policy

  – Packaging can be time consuming (but is no worse than MSI packaging)

  – Negotiations with software vendors regarding certain licenses can be challenging but not impossible
Our Implementation

• Software deployment group
  – 3 different methods of software distribution

  • Option 1
    – Application as part of the image; always available software, eg. Office, Antivirus...

  • Option 2
    – Application distributed via SCCM
      » Specialist software in specific labs

  • Option 3 - Cloudpaging : ALL the rest
Our Implementation

- Our AppStore
  - Available to all Students (and Staff)
  - 100+ Applications for Students to use on their own laptops
  - Delivery of Apps to distance learners
The Benefits

• For our students:
  – Wider availability of software in classrooms, labs, library etc
  – Software is available for unmanaged devices (BYOD)
  – Shorter distribution cycle
  – Updates and patches at anytime, not just when we have time

• For the ICT staff:
  – More flexible and easier deployment of software
  – Less software conflicts on end user devices
  – Easier deployment of PCs in classrooms (smaller images)
The Benefits

• For our teaching staff:
  – More flexibility in classroom usage
  – Shorter software deployment cycle
  – Ability to choose

• For our budgets:
  – Better feedback about usage of software titles
    • Ability to budget for our software titles
    • The flexibility on moving licenses around
    • Being able to monitor exactly what we use
to tighten up license negotiations
The Benefits

- We are happy with our choice of Software Delivery mechanisms:
  - It’s made us more efficient
  - It’s given us the flexibilty to be more agile
  - It’s made our students happy - they can now use software on their devices
  - It’s made our lecturers happy - they can use applications in any room (even if we we only have a few licenses)
  - It’s made our IT staff happy – by taking the “fun” out of creating big images (and praying it all works!)
  - It’s enabled all of the above...
    ...without giving our finance department a heart attack!
The Benefits

• Does Cloudpaging from Software2 solve all our problems?
  – Not all of them...
    ...but it solves a lot more problems than it creates!
Questions?

Jan Van Calster
Jan.vancalster@odisee.be