Visio Automation for Infrastructure Design and Management

David Cuthbertson
Square Mile Systems / AssetGen
A Few Questions

• Anyone here attended previous Visio workshops?

• Which is easier and faster to complete?
  a. Updating a Visio drawing with changes
  b. Re-drawing into Visio a drawing sent in Cad/PDF/JPEG/BMP

• How do you get 6500 racks drawn with consistent format and detail by different engineers?
Lack of Information Causes Pain

1. Buy things you don’t need
2. Don’t buy things you do need
3. Reverse engineer with every project
4. Fault resolution takes longer
5. Problems escalate with distractions
6. Unnecessary site surveys
7. Project timescales are not predictable
8. Repeated “one off” audits
9. Overload key individuals
10. Less confidence in security controls
11. Inability to optimise team processes
12. Unplanned change disruption
13. Duplicate what can’t be found
This Workshop Will Show

• What can be **reduced** with Visio
  
  workload  - skills dependent
  cost     - $26 or $20,000
  time     - 16 minutes or 25 days
  - 4 hours or 7 years

• How to improve diagram quality and accuracy

• All of which you can do later today - yourself!!
Visio Automation Agenda

1. Understand Visio – out of the box
2. Diagramming techniques
   - Making it simpler for all
3. Linking Visio to data sources
   - Reduce cut/paste, diagram refresh, consistency
4. Automation for larger infrastructures
   - Automated creation and updating
Diagrams Should Explain The Complex!

A diagram or schematic is often a simplified view for easy understanding.
If A Picture Paints a Thousand Words

How do we paint a thousand pictures?
Understanding IT Dependencies Isn’t Easy

Many 1,000s of documents are created by projects, operations and risk processes.
Lots of Dependencies Need Lots of Diagrams
Diagrams Also Cover Processes

Projects

Design Team

Deployment Planning

Build Team

Change Mgmt.

Request

Std Components

Yes

Design Review

Outline Design Doc

QA Check

Release

Handover

Detailed Plan

Forward booking schedule

Book Contractor

Allocated dates

Schedule Change

Accept/Reject

Reject

Accept

Deployment design

Yes

Request form

No

Change from reserved to allocated

Confirm Contractors

2018 BICSI Fall Conference & Exhibition
1. Visio Basics

- **Visio history**
  - 1992 First released, 2000 acquired by Microsoft
  - Last non-MS versions had auto-discovery, equipment templates – all removed with Visio 2003

- **Versions**
  - Visio 2016 Standard
  - Visio 2016 Professional
  - Visio Pro For Office 365
  - Visio Viewer (runs in IE browser)
  - Visio app for iOS
  - Visio online – web based collaboration
Which Version - Standard or Professional?

• No thought required – Go for Professional!

• Why?
  • More extensive selection of shapes
  • Data linking (look for data tab)
  • Data graphics – saves typing and redrawing diagrams
  • Visio extras – draw a large floor grid in seconds

• An hour saved in a year makes it worth it!
Visio Resources And Help

• Microsoft web site
• Books
• LinkedIn group – Visio Enthusiasts
• Equipment manufacturer web sites
  • Cisco, CommScope, Siemon
  • HP, Dell, IBM, others  [www.visiocafe.com  www.shapesource.com]
• 3rd Party stencils
  • netZoom, others  [www.altimatech.com]
• Visioguy forum  [www.visguy.com]
Templates, Stencils, Shapes

Categories
- Business
- Engineering
- Flowchart
- General
- Maps and Floor Plans
- Network
- Schedule
- Software and Database

Templates
- Active Directory
- Basic Network Diagram
- Detailed Network Diagram
- LDAP Directory
- Rack Diagram

Stencils
- Shape
Visio Concepts and Terms

- Template
- Stencil
- Shape
- Shape properties
- Connector
- Background
- Layer

Properties
Cisco 2950
10.6.2.32
Live

Data Centre
Comms Room
Visio Basics -1

- Creating new diagram from a template
- Manipulating shapes on a page
- Aligning and Distributing Shapes
- Copy, Paste and Duplicate Shapes
- Grouping and ungrouping shapes
- Foreground and Background options
- Zooming in and Out of the Page
- Using the Drawing Toolbar to create basic shapes
Visio Basics - 2

- Connectors
- Static and dynamic glue
- Adding, deleting and moving connector points
- Using different stencils
  - Stencil search
- Shape behaviour - 1d, 2d, drill down
- Working with text
  - Object text
  - Freeform text
  - Text block tool
Static Glue

• Static glue is to a particular connection point
• The connection points used don’t move even if the shapes are moved
Dynamic Glue

- Drag connector onto shape and wait until shape is highlighted in red
- If you move the shapes relative to each other the connection moves appropriately
Using Different Stencils (and searching)

- Use Shapes tab
- Select via menus
- Use Search options
- External stencil sets
  - Suppliers, 3rd party
Danger! - Visio File Sizes

Two files

Diagram 1  1995kB
Diagram 2  12kB

Diagram 1 is 166 times the size of Diagram 2!

Some tips to reduce file sizes
2. Diagramming Techniques

Good diagramming practice – think of levels of information

1. The detail that you see
   - What is seen visually / printed

2. Additional data / information within diagram
   - Additional action by viewer – display, click, show layer, etc.

3. How you get to other information
   - Drill down, open files, launch remote session
The Process of Creating a Diagram

1. Which takes the most time?
2. Where can errors creep in?
Diagram Process Examples

1. Purpose
   - Rack Diagram R01
   - Network Diagram Orlando LAN

2. Gather data
   - Select Rack R01 Inventory
   - Switches / Router in Orlando

3. Define shapes
   - Match to Physical Shapes
   - Match to Logical Shapes

4. Transfer data to diagram
   - Create Shapes
   - Create Shapes and connections

5. Layout
   - Place/size to position in rack
   - Move/size for readability

6. Add extra detail
   - Notes, etc.
   - Notes, etc.

7. Save
   - Save as Rack R01
   - Save as Orlando LAN

8. Send / publish diagram
   - Store on server Intranet/SharePoint
   - Store on server Intranet/SharePoint
Is This A Good Diagram?
Does It Have These Characteristics?

1. Title
2. Purpose
3. Author
4. Version
5. Date
6. Instructions
7. Symbols
8. Attributes
9. Connections
10. Grouping
11. Background / layers
Visio Examples

• Floor plans
• Importing CAD / other formats
• Layers
• Data center floor plans
• Backgrounds
• Hyperlinking
3. Linking Visio To Data Sources

• Saves typing mistakes
• Enables refresh of data
• One diagram can serve multiple purposes
  • Less to maintain
• Multiple views of one device
  • Less to maintain
• Enables use Of Data Graphics Feature
Understanding Reality

To understand infrastructure and manage change

We need multiple views
- Rack schematics
- Equipment configuration
- Physical connectivity
- Logical end point connectivity
- End device connectivity
Types Of Information / Documentation

What should be updated with a server or network change?

1. Update project documentation with “as built” details
2. Update asset/inventory list
3. Update rack diagrams
4. Update network patching records
5. Update switch port usage and capacity
6. Update floor plan rack capacity
7. Update power usage spreadsheet(s)
8. Update storage / backup system documentation
9. Update systems architecture documentation
10. Update DR lists and documents
11. Update supplier maintenance records
12. Update billing and charging data

The larger the environment – the more there is....
Multiple Device Instances in Diagrams
Reducing The Workload!

Excel  <->  Visio

Floor box list  <->  Floor plan
Cabinet list  <->  Equipment room floor plan
Patch panel list  <->  Backbone cabling diagram
Inventory  <->  Network diagram
Inventory  <->  Rack diagram
Inventory  <->  Server connectivity diagram
Using External Data Sources

New

1. Purpose
2. Gather data
3. Define shapes
4. Transfer data to diagram
5. Layout
6. Add extra detail
7. Save
8. Send / publish diagram

Updating

1. Purpose
2. Gather data
3. Check diagram for match
4. Add / Delete shape Connector, Data
5. Review Layout
6. Add extra detail
7. Save
8. Send / publish diagram

Time saving
Visio Data Graphics

• Standard feature 2007/10/13/16 Professional

• Enables use of embedded data
  • Display multiple text fields around a shape
  • Data bars to show capacity
  • Use icons for status differences
  • Change shape colour based on data value
Limitations Of Visio / Data Source

• Good for quick diagrams
• The data transfer and refresh is automated, but the filtering and selection is manual
• It doesn’t connect shapes together
  • Limits value in a network environment
• New devices / links are not added to diagrams
First Steps For Multiple Diagrams

• Control use of shapes / stencils
• Follow best practices for diagram information
• Save reference versions in common areas
  • File locations
  • Web site
  • SharePoint
• Use a common source where possible for shape data
  • Databases preferred to spreadsheets
  • Create views to suit diagram information need
4. Automation For Larger Infrastructures

• Looking beyond a few spreadsheets
• Minimise manual maintenance effort
  • Scale and separation of roles demands it
• Improving accuracy and consistency
  • Software driven diagram production
• Infrastructure document management
  • Shared across teams, controlled access
Automating Documentation - Example

• Manual method – draw a rack diagram 2 – 5 hours
  • Gather rack inventory data and positioning
  • Find Visio shapes for equipment
  • Draw the rack

• Automated method with software 10 seconds
  • Tick rack for cabinet drawing
  • Visio rack diagram produced

• 100 racks – 16 minutes or 25 days or $26 vs $20,000 ($100hr)
• 6500 racks?? - 1625 days / $1.3M (no PM or expenses) - $1.8M (with)
  - 4 hours (overnight automated process per site)
Automated Enterprise Drawing

• Should we draw and redraw diagrams in Visio or have a GUI that does this onto a database?
  • Yes for simple views (i.e. rack, path) DCIM/CMS approach
  • No for anything that requires layout or crosses technologies
    • Physical – floor plans, blown fiber, cabling runs, OSP
    • Logical – LAN/SAN/VLAN/WAN/VLAN system

• If we are refreshing data, then we have to update existing shapes, adding/removing shapes and connectors.
  • Beyond Excel/Visio data linking
Extending Visio Automation

New

1. Purpose
2. Gather data
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Time saving

Database Automation
Simple Goals

• Draw 60 rack diagrams and save on a file server, in folders listed by room location
• Check and update 100 site network diagrams with changes in devices, connections and data
• Refresh an updated set of build documents covering racks, hardware, cabling, power within a data center transition project
• When – now, tonight, every Friday
Many Infrastructure Information Needs

- **Project and tasks**
  - Ease and speed of creation
  - Ease of distribution
  - Flexible to meet task needs
  - Limited training

  **Examples**
  - Project documentation
  - Equipment lists
  - Visio/CAD diagrams
  - Test results

- **Operations And Risk Control**
  - Ease of use by many
  - Structured for integration & reporting
  - Support for multiple processes
  - Wide scope – the big picture!

  **Examples**
  - Asset and Inventory management
  - Business / service dependencies
  - Monitoring of performance, status
  - Risk and Recovery
Infrastructure Documentation Workflow

Project / Design teams → Operations → Audit & Compliance Team (s)
Infrastructure Documentation Workflow

Project / Design teams

Operations

Audit & Compliance Team (s)
Diagram Automation Examples

1. Purpose
2. Gather data
3. Define shapes
4. Transfer data to diagram
5. Layout
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Maintain - Infrastructure Knowledge

- Plan
- Build
- Operate
- Risk
- Dispose

**Project and tasks**
- Ease and speed of creation
- Ease of distribution
- Flexible to meet task needs
- Limited training

**Operations And Risk Control**
- Ease of use by many
- Structured for integration & reporting
- Support for multiple processes
- Wide scope – the big picture!

Record planning decisions in the operational system
Produce project docs for/from the operational system
Simplify Infrastructure Data Capture

• Data capture focusses on delivering database load files

• Visualization is either created automatically, or by combining data with existing backdrops - floor plans

• No need to check across multiple diagrams / documents for consistency and format

A faster, less complex and less costly audit, which doesn’t require high skill levels within the audit team as software creates/updates the visualization
Making Trusted Data A Reality

1. Establish policies, standards and ownership of data and diagrams. Make it simpler and easier for engineers and managers

2. Have project / operations use common terms & formats
   Supply templates, naming system, labels, etc.

3. Reduce the numbers of documents / files to maintain
   Consolidate into centralised systems and make them easy to find
   Link / create / update Visio diagrams, reports, excel from databases

4. Use operational systems to support planning processes
This Workshop Has Shown

• What can be **reduced** with Visio
  workload - skills dependent
  cost - $26 or $20,000
  time - 16 minutes or 25 days/7 years

• How to improve diagram quality and accuracy
  All of which you can do later today - yourself!!
Visio Automation Tips and Techniques

• Lots of productivity features are unknown
  • Save yourself and others a lot of effort planning and managing infrastructure!
  • Learn more about Visio

• Linking to existing data sources has many benefits
  • Less errors, easier to refresh diagrams and update them
  • Use the data graphics feature to reduce diagram numbers

• For larger environments
  • Assess the value of database driven systems for cost, time and consistency
Additional Materials

www.microsoft.com

www.assetgen.com
Evaluation software
Webinars
Free “DCIM/CMS” evaluation version
Data center practices, Visio integration

www.squaremilesystems.com
Free SMS Visio utilities
Training/webinars/videos
Downloads and videos
Onsite/remote Visio training, documentation methods, etc.