Looking to effectively manage your virtualization infrastructure and workloads?

ControlUp has it all and then some:

👁 **Total visibility of your Virtualization stack**

🧰 **Fast issue remediation from within ControlUp**

🙂 **User experience metrics and optimization**

📈 **Insightful Analytics**

> " *Not only does it provide real-time monitoring, but it has a plethora of tools and features that make administration a breeze. Not sure how we got along without it all these years.* "
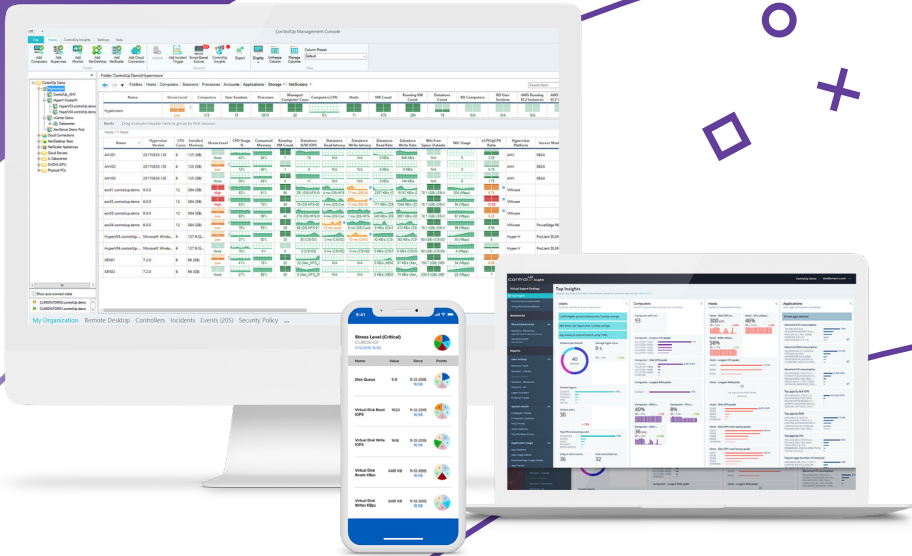
BED BATH & BEYOND®

Lawrence J. Clark
Manager Software as a Service

Compatibility Matrix

VMware vSphere	6.x, 5.x
Microsoft Hyper-V	2016, 2012 R2
Citrix Hypervisor	6.x, 7.x
Citrix Virtual Apps	7.x, 6.x, 5.x (64 and 32 bit)
Citrix Virtual Apps & Desktops	7.x, 5.x
VMware Horizon View	7.x, 6.x, 5.x
Microsoft RDS	2016, WS 2012 R2, WS 2008 R2, WS 2003 TS/RDS
Windows Server	2019, 2016, 2012 R2, 2008 R2, 2008, 2003
Windows Client	10, 8.x, 7, Vista, XP

Microsoft **NUTANIX** **CITRIX®** **vmware** **amazon** webservices

control UP

Complex

IT INFRASTRUCTURE

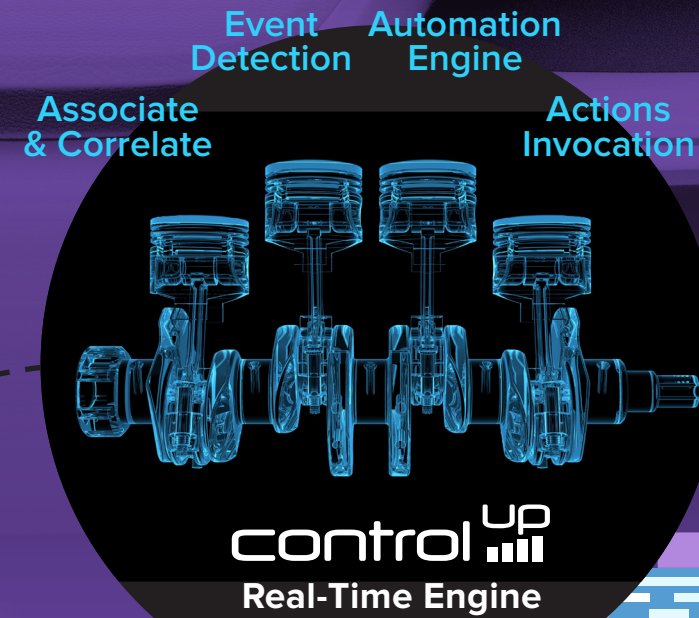**in Plain View**

www.controlup.com

On the Road to Self Driven EUC Operations

control UP
Insights

- Analytics
- Reporting
- Benchmarking
- ML Process

control UP
Real-Time Console

- Realtime
- Troubleshooting
- Expandable
- Automation

Event Detection Automation Engine

Associate & Correlate Actions Invocation

control UP
Real-Time Engine

| RDS | Citrix Virtual Apps & Desktops | Horizon View | WVD | Web Servers | DB Servers | App Servers | | Netscaler | Physical Servers |

Virtual Desktops & Apps **Virtual Servers**

| AWS EC2 | Citrix Hypervisor | vmware | Microsoft Hyper-V | NUTANIX | | |

Virtualization

Folder Clusters

Configuration Stats
Hosts Count, Computers Count, VM Count, User Session Count, Critical Stressed Host/Computer Count, DRS Automation level, DRS Status, HA Admission Control, HA Host Monitoring, HA Status, HA VM Monitoring, Cluster IP Address, Cluster Version, vSAN Enabled, vSAN Disk Configuration, vSAN Health, Hypervisor Connection URL

CPU Metrics
Avg. Hosts CPU, Avg. Computers CPU

vGPU Metrics
Average GPU Frame Buffer Usage, Average GPU Usage, Computers with GPU

Memory Metrics
Avg. Hosts Memory

Disk Metrics
vSAN Free Capacity, vSAN Congestion

Network Metrics
vSAN Host Network Inbound Packet Loss Rate, vSAN Host Network Outbound Packet Loss Rate, vSAN Local Client Cache Hit Rate, vSAN Disk Group Minimum Read Cache Hit Rate, vSAN Disk Group Write Buffer Minimum Free Percentage

UX Metrics
Avg. Logon Duration, Avg. App Load Time

Citrix Virtual Apps
Avg.   Sessions per Computer

Citrix Virtual Apps and Desktops
Delivery Groups: Maintenance Mode, Enabled / Disabled, Desktop Kind, Available / Failed / Preparing / Unregistered Computers Count, Session Support, Delivery Type, Desktop Kind, Connection Failures Count, XD in Use / Published Apps Ratio

AWS EC2
Performance: Avg. CPU Utilization, Disk Read/Write Operations, Network In/Out Cost: Attached/Detached Elastic IP Hourly Cost, Attached/Detached Snapshot Hourly Cost, Attached/Detached Storage Hourly Cost, Days to Next RI Expiration Date, EC2 Instance Hourly Cost, Next RI Expiration Date, Number of Unutilized RIs, RI Upfront Hourly Cost, Total Hourly Cost, Unutilized RI Hourly Cost

Hosts

Configuration Stats
CPU Cores, CPU Sockets, Hypervisor Type, Hypervisor Version, Installed Memory, Running VM Count, Unmanaged, VM Count, VM Count, Maintenance Mode, BIOS Release Date, BIOS Version, Configured EVC Baseline, CPU Logical Processors, CPU Model, CPU Speed, Hyperthreading, Hypervisor Build, Management IP, Maximum Supported EVC Baseline, NTP Servers, NTP Status, Number of NICs, Power Management Policy, Server Model, Server Service tag, Server Vendor, SSH enabled, Uptime

CPU Metrics
CPU Score, CPU Usage %, vCPU/pCPU Ratio

Memory Metrics
RAM Score, Active Memory, Consumed Memory, Memory Ballooning, Memory Compressed, Memory Shared, Memory Swapping

Disk Metrics
Disk Score, Datastore R/W IOPs, Datastore Read Latency, Datastore Read Rate, Datastore Write Latency, Datastore Write Rate, Disk Device Latency, Disk Kernel Latency, Disk Queue Depth, Max Datastore Free Space, Min Datastore Free Space, Storage Repository Total Latency, Datastore Total Latency

Network Metrics
Network Score, NIC Dropped Received Packets, NIC Dropped / Transmitted Packets, NIC Usage, NIC Received Packets Errors, NIC Transmitted Packets Errors

Storage

Configuration Stats
Datastore Name, Datastore Path, Capacity, Datastore Type, Storage I/O Control Enabled, vDisk Attached to, vDisk Controller Label, vDisk Datastore Name, vDisk Disk Mode, vDisk Disk Type, vDisk Host Name, vDisk Thin Provisioned, vDisk File Name, Local Datastore, Compression, Capacity Deduplication, Replication Factor, vSAN Disk Configuration, vSAN Total Used Capacity, vSAN Total Used - VM Overreserved, vSAN Total System Overhead, vSAN Cluster Health, vSAN Network Health, vSAN Data Health, vSAN Limits Health, vSAN Hardware Compatibility Health, vSAN Performance Service Health, vSAN Build Recommendation, vSAN Online Health, vSAN Health, vSAN Disk Configuration, Mount Point, Mount Mode, Total inodes, Free inodes, Used inodes

Disk Metrics
Total IOPS, Read/Write IOPS, I/O Latency, Read/Write Latency, Read/Write Rate, Free Space, vDisk Large/Medium/Small Seeks, vDisk Outstanding Read/Write Requests, vDisk Read, vDisk Read Latency, vDisk Read Load Metric, vDisk Read Rate, vDisk Read Request Size, Outstanding Requests, Flash Mode Enabled, vSAN Congestion, vSAN Outstanding IO, vSAN Total Used - Physically written, vSAN Free Capacity, vSAN Physical Disk Health, vSAN Congestion, vSAN Outstanding IO, vSAN Local Client Cache Hit IOPS, vSAN Local Client Cache Hit Rate, vSAN Maximum Disk Group Read Cache/Write Buffer Latency (ms), vSAN Max Read Cache Read Latency, vSAN Max Read Cache Write Latency, vSAN Max Write Buffer Read Latency, vSAN Max Write Buffer Write Latency, vSAN Disk Group Minimum Read Cache Hit Rate, vSAN Disk Group Write Buffer Minimum Free Percentage, Disk Shares

Network Metrics
vSAN Inbound I/O Throughput, vSAN Outbound I/O Throughput, vSAN Inbound Congestion, vSAN Outbound Packets Per Second, vSAN Outbound Packets Per Second, vSAN Inbound Packet Loss Rate, vSAN Outbound Packet Loss Rate

Computers/VMs

Configuration Stats
Model, Name, OS, OS SP, Physical Addresses, Registered IP Addresses, VM Name, VM Power State, VM Tools State, VM Tools Version, VM Tools, Hypervisor Platform, Error Rate Version State, Guest Name, Host Name, DNS A Records, Domain DNS, Domain Role, CPU Count, AWS Instance, Last Boot, Server, Virtual Machine, Virtual Machine Snapshot Exists, Virtual Machine Snapshot Size, VM - Days Suspended, Workstation, XD Broker, XD VDA, Flash Mode Enabled, Nutanix CVM, Net ERR In, Net ERR Out

CPU Metrics
CPU Score, Host CPU Usage, Processor Queue Length, CPU, CPU Excessive SMP Use, CPU Ready, CPU Swap Wait, CPU System Time, CPU Cores (OS), CPU Cores (VM), CPU Logical Processors (OS), CPU Logical Processors (VM), CPU Model, CPU Sockets (OS), CPU Sockets (VM), CPU Speed, CPU Shares

vGPU Metrics
GPU Architecture, GPU Available Memory, GPU Frame Buffer Size, GPU Frame Buffer Usage, GPU Memory Usage, GPU Model, GPU Number of Cores, GPU NVIDIA driver version, GPU NVIDIA License Port, GPU NVIDIA License Server, GPU Usage, GPU Video Decoder Usage, GPU Video Encoder Usage

Memory Metrics
RAM Score, Active Memory, Memory, Memory SwapIn Rate, Memory SwapOut Rate, Memory Utilization, Physical Memory Used, Pages/sec, Paging File, Non-paged Pool Memory, Dynamic Memory Avg. Pressure, Dynamic Memory Enabled, Max / Min Memory, Memory Demand, Memory Status, Startup Memory (Hyper-V only), Virtual Machine Memory Balooning, Memory Shares

Disk Metrics
Disk Score, Disk Queue, Disk Reads/sec, Disk Transfers/sec, Disk Writes/sec, Avg. Disk Read Time, Avg. Disk Write Time, Free Space on System Drive, Max Free Space Drive, Min Free Space Drive, Physical Disk Time, Virtual Disk Read IOPS, IOPS, Virtual Disk Read Latency, Virtual Disk Read KBps, Virtual Disk Write IOPS, Virtual Disk Write Latency, Virtual Disk Write KBps, Total Read Rate (KBps), Total Write Rate (KBps)

Network Metrics
Network Score, Net Bytes Received/sec, Net Bytes Sent/sec, Net Bytes Total/sec, Dropped/Received Packets, Dropped/ Transmitted Packets, Net Total, Net Received, Net Sent

UX Metrics
UX Score, Avg. Logon Duration, Avg. App Load Time, Avg. User Input Delay, Max User Input Delay

Citrix Virtual Apps
Active Sessions, Processes, ASP Request Queued (Citrix Web Interface), ASP Request Rejected (Citrix Web Interface), CSG Connections, PVS vDisk File Name, WorkItem Queue Ready Count, # of Published Applications, Datastore Connection Failure, Edition, Farm, License Check-Out, License Server Connection Failure, Load Evaluator, Number of Busy XML Threads (Citrix XML Broker), Resolution Time (Citrix XML Broker), Resolution Time (Citrix XML Broker), Resolution WorkItem Queue Ready Count, Server Load, Server Logon Mode, Version, Worker Group, Zone, Zone Data Collector, Citrix Licenses – Available & In-use, Top Citrix License Utilization, Session Disconnect Rate, Number of ICA Sessions, PVS RAM Cache Usage

Citrix Virtual Apps & Desktops
VDA: Availability, Maintenance Mode, Allocation Type, Desktop Kind, Last Failure Time and Type, Registration State and Failure Details, Provisioning Type, Session Support, User Changes Persistence, Current Status, License Utilization; Brokers: Services Status and Health (AD Identity, Broker, Central Configuration, Delegated Admin, Hosting Unit, Monitor, MCS), Hypervisor Connections Availability, Number of Registered Desktops; XD in Use / Published Apps Ratio

Horizon View
Active Sessions, Processes, View Agent Version, Virtual Disk Read IOPS, Virtual Disk Write IOPS

AWS EC2
Configuration: Elastic IP, Host ID, IAM Role, Instance ID, Instance Lifecycle, Instance Status, Instance Type, Kernel ID, Key Name, Root Device Name, Root Device Size, Root Device Type, Security Group (ID), Security Group (Name), Source/Dest Check, State. Performance: CPU Utilization, Disk Read Operations, Disk Write Operations Cost: Attached Elastic IP Hourly Cost, Attached Snapshot Hourly Cost, Attached Storage Hourly Cost, Catalog Price per Hour, Days to RI Expiration Date, EC2 Instance Hourly Cost, RI Expiration Date, RI Upfront Hourly Cost, Total Hourly Cost.

Sessions

Configuration Stats
Session Name, State, User, Processes, Connect Time, Disconnect Time, Domain DNS, ID, Logon Time, Branch Name, User Active Directory Full Name, User Active Directory OU Path and Name

CPU Metrics
Session CPU

vGPU Metrics
GPU CPU Utilization, GPU decoder Utilization, GPU encoder Utilization, GPU Frame Buffer Memory Utilization

Memory Metrics
Memory (Private Bytes), Memory (Working Set), Page Faults/sec

Disk Metrics
I/O Read Operations/sec, I/O Write Operations/sec, Disk Read KB/s, Disk Write KB/s

Network Metrics
Network Send KB/s, Network Received KB/s

UX Metrics
Resource Consumption Score, UX Score, Logon Duration, Avg. App Load Time, Logon Simulator, Protocol Latency, Protocol Bandwidth Usage/ Limit, User Input Delay

Citrix Virtual Apps
Citrix Receiver Version, Client IP, Client Name, Avg. Protocol Latency, Idle Time, Initial Program, Branch Name

Citrix Virtual Apps and Desktops
Receiver Version, Client IP, Client Name, Connection Protocol, Protocol Bandwidth Consumption, Protocol Bandwidth Limit, Applications In Use, Authentication Duration, Brokering Date & Duration, Connected HDX Connection Load Time, Logon Scripts Load Time, VM Start Duration, XD Apps in Use, XD Apps in Use Count

Horizon View
Client IP, Client Name, Idle Time, View Client, Connection Server URL, Domain, Protocol, Tunnel, Type, Branch Name, Avg. Protocol Latency, PCoIP Kbit/sec – Session Avg.

Processes

Configuration Stats
Created Time, Command Line, Publisher, Exe Name, Exe Size (KB), Exe Version, Exit Code, Exit Time, Modified Time, PID, Priority, Parent Session ID, Start Time, PPID, Thread Count, Nice Priority

CPU Metrics
Process CPU

vGPU Metrics
GPU Utilization, GPU decoder Utilization, GPU encoder Utilization, GPU Frame Buffer Memory Utilization

Memory Metrics
Memory Private Bytes and Working Set, Page Faults/sec

Disk Metrics
I/O Read Operations/sec, I/O Write Operations/sec, Disk Read Total, Disk Read KB/s, Disk Write Total, Disk Write KB/s

Network Metrics
Network Sent Total, Network Sent KB/s, Network Received Total, Network Received KB/s

UX Metrics
Application Load Time, Application Load Time Profiler, Browser URL, User Input Delay

Citrix Virtual Apps & Desktops
XD Published App Name, XD Published App Created, XD App State, XD Active Sessions, XD App Instances Count, XD Available / Published Ratio, XD Available On Count, XD Disconnected Sessions, XD managed / running ratio, XD Published On Count, XD Running / Available Ratio, XD Running / Published Ratio, XD Total Sessions, XD Total Users

NetScaler

Configuration Stats
Name, Management IP, Last Save Date, Saved Config, Version, Start Time, Management CPU, Last Config Date, License Expiration Date, HA current node state, HA Heartbeats received rate, HA Heartbeats sent rate, HA Sync failure, HA System State, HA sync, HA propagation

CPU Metrics
NetScaler % of GWs Up, NetScaler % of LBs Up, NetScaler Appliances, NetScaler Appliances with Unsaved Config, NetScaler Gateway Total, Bytes In / sec, NetScaler Gateway Total Bytes Out / sec, NetScaler LB Bytes In / sec, NetScaler LB Bytes Out / sec, NetScaler LB Total Hit Rate, NetScaler Total Traffic In, NetScaler Total Traffic Out, NetScaler Total HDX Sessions, NetScaler Total LB Users Connections, NetScaler Total, SSL Users, % of GWs Up, % of LBs Up, Traffic In, Traffic Out, Days since last save,GW Down, GW Up, HDX Sessions, LB Connections, LB Down, LB Up, Memory Used Percentage, Packet CPU, SSL Users, Stress Level,Total GWs, Total LBs, Days Until Next Certificate Expiration, Days Until Next License Expiration, NetScaler Name, ID

vGPU Metrics
NetScaler Name, Name, State, Primary IP Address, Primary Port, Stress Level, Connections, vServer Health, Active Services, Hit Rate, Traffic In, Traffic Out, Inactive Services, Spill Over, Surge Count, LB Method, Protocol, LB Name, Service Group Name, Service Type, Client Connections, Requests / sec, Responses / sec, Server Connections, Services Up / Total, Server Connections, Client Connections, Total Services, Service Type, State, Effective State

Memory Metrics
NetScaler Name, Name, State, IP Address, Stress Level, Current Users, Traffic In, Traffic Out, Requests / sec, Responses / sec, Days Until certificate expiration, Certificate Name, Certificate Expiration Date, ICA Proxy, LDAP Administrator Bind, LDAP Server, LDAP Server Port, Policy Name, SSO Domain, StoreFront Address, Port, Gateway Name, Auth Id, Stress Level

Disk Metrics
NetScaler Name, Username, Domain, Source IP, Destination IP, Port, Stress Level

Contextual Management Actions

Computer Actions
Flush DNS, RDP to Computer, Send Super Message, Reboot Machine, Send Wake-On LAN Signal, Shutdown Machine, Refresh Machine Group Policy, Import Registry, Disable Process Execution, Enable Process Execution, Run As, Launch Event Viewer, Admin$, NSLookup, Ping, Test WMI, Trace, Force Power Off VM, Power On VM, Restart Guest, Shutdown Guest, Enable / Disable Maintenance Mode

Sessions Actions
Chat, Remote Assistance, Disconnect Session, Log Off Session, Shadow Session, Send Super-Message, Get Session Screenshot, Refresh User Group Policy, Kill Policy, Reapply Group Policy, Registry Import, Start Process In Session

Processes Actions
End Process, Kill Process, PSKill Process, Set Process Priority, Start CPU Throttling

Permission Delegation
Delegate management actions based on AD group membership

Controllers
Manage the registry, services, file system and programs and updates on multiple targets: comparison and batch management

Automation & Script Actions

Script Engine
VB, Powershell, Batch

Contextual Script Actions
Expandable, Customizable, Multi Target Execution, Use Your Own Scripts Or Community and Expert Scripts

Automation Categories
Dynamic UX Optimization, Automatic Remediation, Augmented Troubleshooting, Resource Allocation Optimization

Interactive Historical Reporting & Analytics

Resource Consumption
Host, VM, User Session and Application Resource Consumption, VM and Host Statistics

User Sessions
User Session Count, User Session Activity, User Session Details, Session Resources, Session UX

Application Usage
Application Usage Summary, Application Usage Details, Application Statistics, Application Trends

VDI Management
Logon Duration, Client Versions, Protocol Latency, License Usage

BI & Analytics
Top Insights - an IT Dashboard with A Smart BI Engine and Unique Findings as Well as KPIs, Environment Assesment Report, Sizing Recommendations Report

Enterprise Features
Web and Mobile UI, Scheduled Reports, Permission Delegation