InTalent

CLOUDFARMS

Virtual Infrastructure Delivered your way.

CloudFarms - Virtual Infrastructure

CHALLENGES OF VIRTUAL INFRASTRUCTURE MANAGEMENT

Enterprises are building real-time virtualized IT infrastructures, plus private and hybrid clouds to fundamentally transform the way they deliver services. This presents significant challenges to enterprise IT staff, who are already challenged by the increased complexity and management issues of virtualization.

- Inadequate enforcement points and policy latency — The complexities of these environments make it very difficult to enforce "when" and "where" policies. Real-time virtual environments require immediate policy enforcement, particularly in relation to security and compliance. When environments are distributed or heterogeneous, enforcement points and latency become even more difficult.

- Limited visibility and data latency - Limited insight and visibility into events and changes and lack of real-time access to complete and correct information about the environment constrain the scope and effectiveness of policies. The more comprehensive the policy requirement, the broader the information necessary to enable it. High-latency or stale information will limit a policy's effectiveness or preclude its use.

Many IT organizations are trying to manage these real-time and dynamic virtual environments using legacy tools, which were not designed for virtual environments, or patchwork solutions, which are poorly integrated, don't scale, and can't support a distributed infrastructure. The challenges of integrating disparate tools, data reconciliation, and high-latency render these approaches ineffective for operational decisions and real-time management. As a result, IT organizations don't have a current and reliable view of their environments.

Virtualized IT infrastructures and private cloud environments present significant challenges for ensuring compliance and enforcement of IT policies and standards. Without effective and automated policy-based management, IT organizations are exposed to security and compliance risks and are faced with reduced availability and higher costs. Policy-based control and automation are difficult in these environments for a number of reasons

- Lack of situational awareness and context — Complex environments need policy enforcement that can adapt to a wide range of circumstances and conditions. Weak policies will require constant upgrading, will not provide broad enough coverage, and will not be reusable. Policies need to be able to be scoped accurately to ensure correct application and enforcement.

- Legacy automation tools — Many legacy "list and script" tools were not designed for virtual environments and don't support the range of automation activities necessary for these complex, highly dynamic environments. These same tools are limited in functionality and difficult to implement and maintain, resulting in lower productivity and higher costs.
- Lack of automation points — Automation needs to be invoked where and when necessary, driven by changes, operator actions, trends, performance, or a combination of these. Additionally, automation needs to be initiated by a user, admin, or operator, either on a schedule or through integration with other tools and processes.
- Impaired visibility and latency — Real-time visibility into the environment is essential for automation to prevent decisions being made based on incomplete, out-of-date, and incorrect information. Limited visibility constrains the scope and scale of automation, resulting in lower value and higher costs.

Virtualized IT infrastructures and private and hybrid cloud environments require reliable IT, process, and task automation to ensure they are effectively managed, correctly configured, highly optimized, compliant, and secure. Enterprises face a number of major challenges trying to automate in these environments

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INTRODUCTION

INTALENT CLOUDFARMS AT-A-GLANCE

INSIGHT
Comprehensive visibility into utilization, performance, configuration, operational activities, and events

CONTROL
Real-time enforcement of enterprise cloud resource, configuration, and security policies

AUTOMATION
IT process, task, and event automation, with model-driven workflows
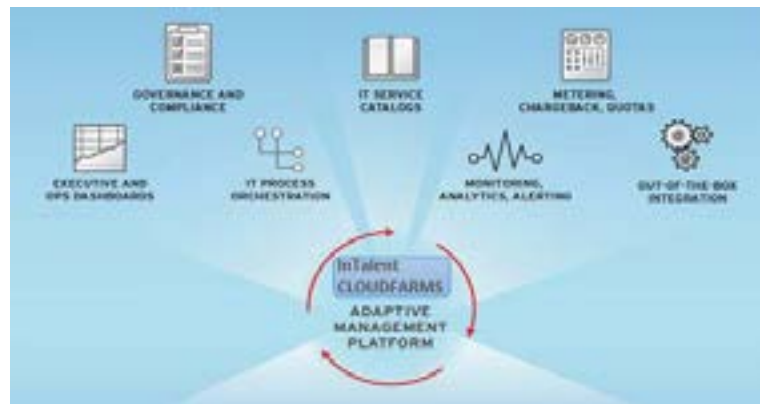
INTEGRATION
Bidirectional integration with existing infrastructure and systems management tools

ANALYTICS
Self-learning analytics, including operating ranges, trends, bottlenecks, and efficiency

Enterprises are providing dynamic virtual infrastructures and private cloud platforms, enabling increased agility, lower costs, and higher service levels. Unfortunately, many IT management tools and approaches were never designed for these new infrastructures. These traditional tools and approaches can't keep up with the real-time changes that occur in virtual environments and, as a result, the information they provide is out-of-date, incomplete, and unreliable. This leads to ineffective decision making and the ineffective management of virtual environments due to the challenges of too integration, data reconciliation, and high-latency.

To manage these environments effectively, IT organizations need a current and reliable view of the environment as well as a high degree of control and automation. As they transform their infrastructures, IT organizations also nee to transform their management tools and processes. InTalent CloudFarms wa specifically designed for these new environments, solving the unique challenges they present.

MANAGING A VIRTUAL INFRASTRUCTURE

CloudFarms provides the insight, control, integration, and automation capabilities you need to effectively manage your virtual IT infrastructure, virtual disk, and private cloud environments. CloudFarms helps enterprises get insight and visibility, establish controls, enforce policies, automate and delegate management activities, and achieve strategic integration with closed-loop automation for IT service management processes across their virtual environments.

Automated Operations	
Security & Compliance	Business Continuity and Disaster Recovery
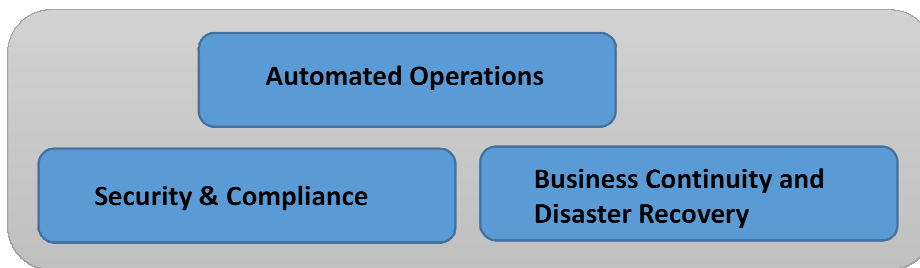
CloudFarms provide a new approach to managing virtualization and Infrastructure management in the cloud.

CloudFarms provides essential management capabilities necessary for real-time, policy-based adaptive management and automation. Our comprehensive virtual infrastructure management solution includes:
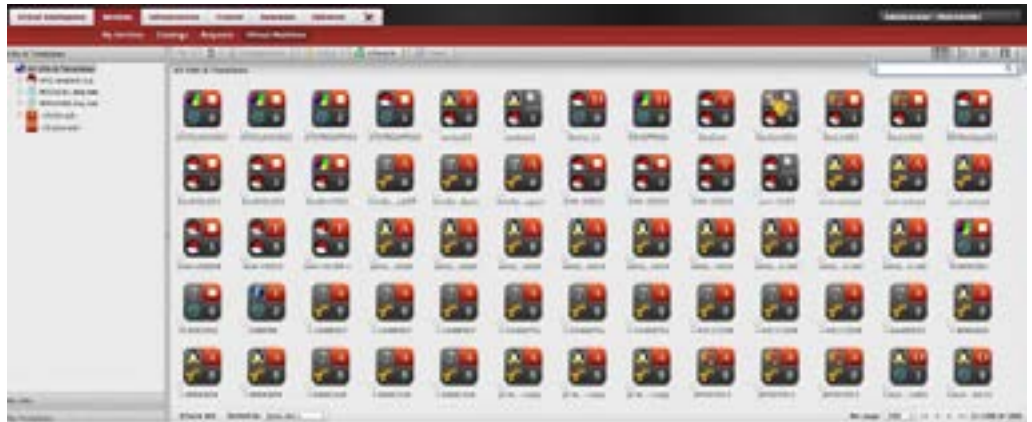
- Virtual machine (VM) life cycle management resource management, optimization, and capacity planning
- Delegated administration and distributed operations
- Configuration management
- Compliance, security, and auditing
- Reporting, analytics, and visualization
- Cost allocation, chargeback, and usage

- VM life cycle management - Including automatic discovery, tracking, inventory, analysis, assessment, aging, and retirement
- Self-service provisioning and self-management - Through a rich, web-based portal with fine-grained access control and support for request management, tracking, and approval
- VM configuration management - Including automatic, agent-free deep discovery, analysis, assessment and tracking of software, accounts, users, groups, patches, services, packages, registry keys, MD5s, and configuration files.
- Comprehensive base-lining and drift - Including the virtual hardware, settings, guest configuration, network settings, as well as relationships and classifications.
- Real-time policy-based VM standards enforcement - Assessment, analysis and policy-based enforcement of configuration, operational, network, resource, and security standards

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VM LIFE CYCLE MANAGEMENT

Managing and tracking VMs from discovery and creation through retirement is essential to avoiding sprawl and keeping the virtual environment well-managed and optimized. There is a common misconception that VMs and resources are free. Unmanaged VM proliferation can cause VM sprawl, wasting storage, consuming server capacity and network bandwidth, and incurring additional software license expenses. There are also additional risks and challenges associated with managing, securing, and patching VMs, managing offline VMs, and ensuring compliance across the virtual infrastructure.

- Resource monitoring and optimization - Performance monitoring, identification of over-allocated resources and current and future bottlenecks, automatic VM aging and retirement, snapshot management and resource policy enforcement
- Quota enforcement, usage, chargeback and cost allocation - Detailed usage tracking by configurable classifications with support for multiple rates tables, fixed cost, allocation, and usage- and reservation based chargeback.
- Advanced capacity planning, trending and best-fit VM placement - Factors in resource availability, policies, and business classifications across time periods optimizing planning and VM placement

CloudFarms provides the ability to manage VMs across their life cycle from provisioning or conversion (P2V/V2V) through operations and eventually to VM retirement. CloudFarms automatically discovers, assesses, classifies, monitors, and tracks VMs in any power state without installing agents. CloudFarms maintains comprehensive visibility of VM configuration, virtual hardware, performance, event, utilization, allocation, and event information together with relationship and dependency mapping.

RESOURCE MANAGEMENT, OPTIMIZATION, AND CAPACITY PLANNING

Virtualized IT infrastructures present major challenges to capacity planning, resource utilization, and optimization. These shared infrastructures introduce significant complexity to resource management and capacity planning.

Measuring utilization in a virtual infrastructure is impossible with traditional management tools and requires new technologies and approaches. Significant management complexity is introduced by the layer of abstraction that accompanies clusters and resource pools, and that hosts cloud visibility. Complexity is also introduced by the fluidity created by new capabilities such as resource reservations, DRS, and high availability.

While resource utilization data in a virtual infrastructure can be obtained using new, virtual-aware techniques, this data alone is insufficient to manage, optimize, and plan the virtual infrastructure. This quantitative capacity and utilization data by itself lacks the qualitative information necessary to answer complex questions like:

- What is driving server utilization higher? What changes were responsible for the increase in demand or decrease in capacity? Were VMs added? Did hardware change?
- Why is SAN utilization dramatically increasing? Which users or groups are responsible for the increase? What is on the SAN and who owns it?
- How many more VMs can the infrastructure support? How many VMs are being retired? How many are underutilizing their resource reservations? How many VMs are over-allocated on vCPU's, memory, or storage?
- Why are some VMs performing well and others poorly when they were all derived from the same source? What's different? When did something change?

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CloudFarms provides IT administrators and managers with advanced capacity planning and sophisticated resource management capabilities, including trending and alerting. By combining extensive configuration and change information and operational event data with utilization and performance statistics, the product uniquely addresses both the quantitative and qualitative management requirements needed by enterprises to get the most out of their infrastructure investment with the lowest management costs.
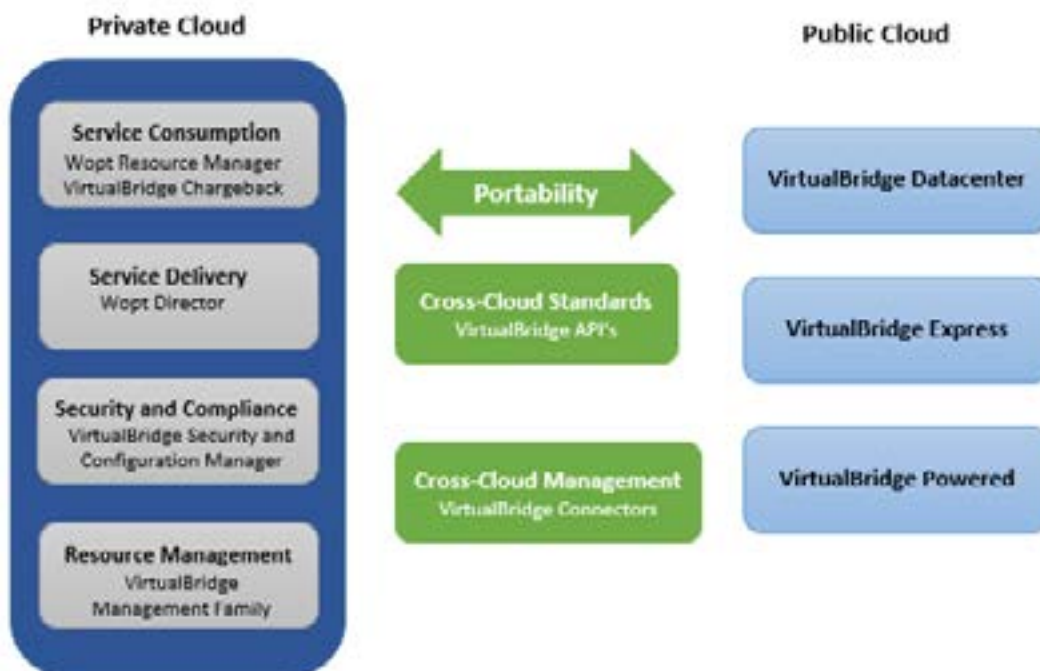
CloudFarms solutions are based on open standards to ensure interoperability and portability across cloud infrastructures

DELEGATED ADMINISTRATION AND DISTRIBUTED OPERATIONS

As virtualized IT infrastructures evolve, the administration and operations requirements change significantly. Virtualization impacts roles and responsibilities in very significant ways. As IT organizations have quickly learned, new ways are needed to enable users and IT staff to have the right access and control appropriate for their jobs and responsibilities.

Virtualization also introduces new capabilities and activities that need to be managed that never existed in physical environments, such as pausing a VM, manipulating snapshots, or cloning. In these high-speed, dynamic, and complex virtual environments, it is important that access controls keep up with the rate of change and do not require manual intervention or delays in entitlement.

CloudFarms provides the ability to delegate administration and operations on a fine-grained level. This allows different roles in the IT organization to have access to the virtual infrastructure necessary for their responsibilities. Custom roles can be defined and the technology enables the use of smart tags to control the visibility and control each role has over VMs and the virtual infrastructure.

CloudFarms offers a broad set of delegated administration and operations capabilities, including:

- Role-based delegation — Ability to define roles and limit management scope based on location, function, application, zone, life cycle, VM content, and any user defined criteria. Control role-based, self-service provisioning of VMs by assigning tags and retirements dates.
- Contextual awareness — Ability to define taxonomy and arbitrary classifications, enabling business-specific tagging to be used for automated access control.
- Enterprise support — Support for roles and delegated administration over multiple datacenters, multiple management systems (e.g., virtual centers). Integration with enterprise directories such as Active Directory or Tivoli Directory Server for authentication and role definition.
- Comprehensive operations and support tools — Collect and process capacity and utilization data into charts to identify bottlenecks and view usage trends for VMs, hosts, clusters, and data stores. Show tightly integrated, powerful timelines to understand what activities are taking place for a given time period for management systems, hosts, clusters, and VMs.

CONFIGURATION MANAGEMENT

Effective configuration management of virtual infrastructures is essential to reliability, security, and availability. VMs are only as available and secure as the hosts on which they execute, the storage on which they reside, and the networks to which they are connected. A performance problem or an out-of-space condition on a data store, a misconfigured network connection, or un-patched host can severely impact the ability of your VMs to perform as required in your enterprise. CloudFarms comprehensively manages VMs together with the infrastructure they run on.

Key features of CloudFarms configuration management capabilities for virtual infrastructure include:

- Continuous discovery, tracking, and analysis of virtual infrastructure
- Virtual infrastructure management
- Host management and compliance
- Performance and availability management
- Enterprise support and scale
- Capacity management, optimization, and waste
- Predictive analytics and resource planning

- Continuous discovery, tracking, and analysis of virtual infrastructure - CloudFarms monitors and correlates events, performance, utilization, and configuration changes. CloudFarms also tracks and maintains accurate inventory and configuration information as well as the relationships among VMs, hosts, clusters, data stores, and virtual platform management systems such as virtual center.
- Virtual infrastructure management - Policy-based management of virtual infrastructures includes settings, patches, services, firewalls, networks, VLANS, port groups, data store, and host placement of VMs, as well as identification and removal of orphan VMs.
- Host management and compliance - Host comparison and drift analysis are available to compare configurations of multiple hosts or compare a host or cluster to itself at different points in time. Configurations can be checked against standard configurations with easy identification and reporting of any deviation from standard or gold configurations. Alerts can be triggered based on non-compliance, changes, events, host log messages, performance thresholds, workload changes and more.
- Performance and availability management - Powerful visualization capabilities include reports, analytics, change alerts, and virtual timelines to enable the quick identification and context of performance and availability problems. Automatic change detection (drift), alerting, and policy enforcement can ensure systems stay configured correctly and securely.
- Enterprise support and scale - Federated management across the virtual infrastructure including monitoring and operations activities can be performed from CloudFarms across shared sessions. This enables delegated administration and operations while dramatically reducing the number of concurrent sessions to management systems.
- Capacity management, optimization, and waste - Capacity and utilization are tracked for hosts, clusters, and data stores, enabling alerting, reporting, and executive dashboards with views of capacity, CPU usage, memory usage, disk I/O, network I/O, CPU ready states, number of running VMs, number of running hosts, used space, and used space by file type including disk, snapshot, and memory. Trending and alerting enables effective capacity planning and prevents outages by ensuring enough capacity is available.

- Predictive analytics and resource planning — Current and future bottleneck identification helps optimize hosts and clusters, projecting your future needs, and showing where resources are under-allocated or over-allocated. CloudFarms supports best fit placement of VMs on provisioning or registration. It provides what-if planning tools to determine how many more virtual machines can be added to hosts and clusters, and where best to put them is based on performance and policies.

COMPLIANCE, SECURITY AND AUDITING

Maintaining compliance and ensuring security in virtual environments is very difficult due to the complexity, rate of change, and access control challenges. In many ways, the same dynamics of virtualization that have enabled rapid provisioning, dynamic reconfiguration, and shared infrastructures create a new set of security and compliance challenges. The ability to reconfigure networks, manipulate VM snapshots, tamper with VMs, and mix disparate workloads requires automated management and control to ensure security. Maintaining compliance with regulatory or enterprise standards is rendered more difficult by the many additional ways systems can now be accessed, changed, and manipulated.

CloudFarms provides continuous and comprehensive discovery and tracking, event disclosure, base lining, and drift detection for the virtual infrastructure and the associated VMs. This creates a detailed and complete view of the complex, high-speed changes occurring in the environment.

- Configuration Policies
- Resource allocation policies
- Security Policies
- Compliance Policies

Role-based administration and operations can be delegated at a fine-grained level, ensuring only the minimum required access necessary is provided. CloudFarms enables the specification and enforcement of policies across VM provisioning, configuration, VM and host operations, and VM life cycle activities. Policies can be used to control access and operations, VM configuration content — including software, patches, accounts, users, groups, settings, virtual hardware, and networking — as well as VM placement and resource allocation and usage.

With CloudFarms, during VM provisioning, security and configuration policies can be automatically checked while the VM is still offline with no requirements for any agent or update to the VM. During a VM power-on operation, the VM configuration can be checked against policies — before the VM is started. If the VM does not conform to policies, it can be rejected, quarantined, or automatically reconfigured or relocated. The policies can automatically be adapted for different stages of the VM life cycle, different requirements such as running in the DMZ, or for classified, highly secure systems.

All of these activities are thoroughly logged and controlled through role-based access control. CloudFarms provides the ability to create a wide spectrum of policies to ensure that your environment is secure and running with your requirements. These policies include

- Configuration policies enforce operating system requirements, check versions, and verify the existence of key services. Account policies verify account existence and account properties while application policies check application versions and properties.
- Resource allocation policies ensure that VMs are correctly configured and optimized for CPU, memory, and storage, and are properly placed in the virtual infrastructure.
- Security and compliance policies check for patches and security configurations, including firewall, network, and account access.
- VM life cycle policies manage VM provisioning, operations, and retirement throughout the virtual infrastructure by role and job function.

CONCLUSION

Many IT management tools and approaches were never designed for virtual environments. If these traditional tools and approaches cannot keep up with the real-time changes that occur in virtual environments the information they provide is out-of-date, incomplete, and unreliable. To manage these environments effectively, IT organizations need a current and reliable view of the environment, a high degree of control and automation and new IT processes. InTalent CloudFarms was specifically designed for these new environments, solving the unique challenges they present.

About InTalent

InTalent is an innovative and emerging leader in Information Technology providing services in the areas of software development, software/application maintenance, IT infrastructure, Enterprise resource planning, customer software solutions and wireless and cloud computing technologies. InTalent is backed by a highly dedicated team of engineers along with an emerging center of excellence in Wireless and Cloud based technologies to provide the highest quality IT solutions, services and resources.

InTalent

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