SGI VizServer with NICE Software
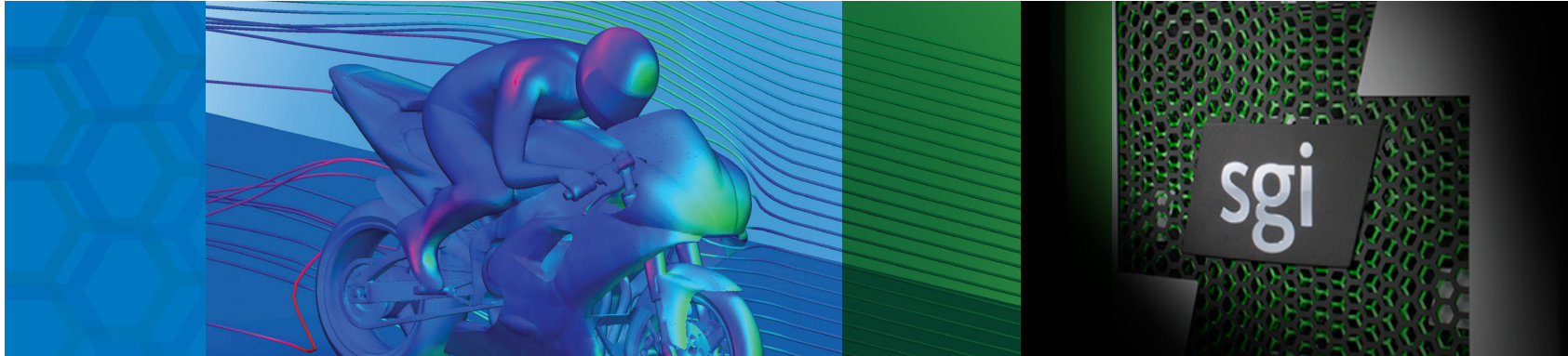
With engineering and scientific support staff caught between the desire for high-performance anywhere computing and shrinking IT budgets, IT managers and senior architects at large companies are witnessing a radical shift in the way they are being asked to provide IT services to an increasingly demanding technical user base.

The explosive growth of simulation models and technical data is leading to major consolidation trends in storage and computing resources. More data needs to move from the data center to the engineers' workstations, but IT professionals also need to serve an increasingly distributed workforce. This makes it difficult to efficiently deploy workstations everywhere they're needed. Moreover, the complexity of this infrastructure requires training and procedures that affect user productivity and time-to-results. Finally, security concerns often require IT managers to provide onerous "need to know" access to technical data and applications.

How can IT professionals reduce costs and provide secure, efficient services to their distributed, diverse user base? Is there a way to leverage mobile technology to foster better collaboration for end users?

Many companies are turning to technical cloud software to address these challenges. These solutions help IT professionals reduce infrastructure costs and increase IT agility by leveraging cloud computing technologies to deliver consolidated and secure high-performance computing and 3D visualization services. Now technical staff can focus on solving difficult engineering challenges.

Customer Challenges:

Slow Data Transfer and Loading Times

Long software load times, large models that require more memory, and congested networks reduces engineer productivity. This means fewer resources to pursue projects due to inefficiency and time lost waiting for software and models to load.

High Cost of Upgrading Desk-Side IT Infrastructure

Upgrading network cabling and workstations requires a significant capital investment due to the high cost of labor for cabling, core network upgrades, and new or upgraded workstations. Most existing network speeds can only accommodate a 100Mbps connection, which can cause significant delays for higher-end applications.

Human Error and Inefficient Resource Usage

In HPC environments, multiple engineers use clusters of multiprocessors to run more detailed simulations. The more complicated the job, the greater the risk that command line parameters may be entered incorrectly.

Remote Collaboration Difficulties

Remote collaboration often requires groups of engineers to access the exact same version of the file and application. If the file has been modified locally and not synced with the server, collaborators may not be looking at the same data. Reconsolidating the data is complicated, and work groups can lose track of who has the latest version of the file.

Poor Mobile Application Performance

Laptops lack the graphics cards and memory required for traditional 3D modeling or HPC software, leading to lost productivity on the road and at remote locations. Slow, disjointed rendering causes lost productivity and makes it impossible for engineering staff to respond to emergencies or check jobs remotely. As a result, companies often experience significant project delays until engineers can return to the office.

Security Breaches and Data Theft

Downloading full models to workstations exposes companies to data theft. Users can easily copy the models to a USB drive and create derivative works that could cost the company millions. However, deploying robust desktop security often results in lost productivity and requires substantial investments.

About NICE Software

NICE EnginFrame™ software, NICE's HPC portal offering, is an advanced, commercially supported grid portal that provides access to grid-enabled infrastructures, HPC clusters, data, licenses, and interactive applications. It can be accessed by any authorized user with a standard web browser. EnginFrame deftly handles computational-intensive and - parallel job submission, control, and monitoring. EnginFrame is based on standard protocols that facilitate the deployment of engineer-friendly portals to create, discover, and explore more efficiently. It provides for encrypted access and file transfers, protecting intellectual property and infrastructures.

NICE Desktop Cloud Visualization™ (DCV) software, NICE's remote 3D "virtual workstation" offering, is an advanced remote 3D access technology that allows technical end users to access robust 3D modeling tools through a web-based portal. IT professionals can share GPUs and memory across multiple user sessions. Data resides securely in the data center, reducing load time and offering IT professionals the option of granting data and application access based on the user's needs.

EnginFrame and DCV applications work together to deliver the best attributes of cloud computing and technical software. IT professionals are provided with an intuitive yet powerful solution that increases user productivity while eliminating expensive upgrades. EnginFrame software provides HPC capabilities to run large solver calculations, while the DCV solution provides the 3D modeling tools needed for remote viewing of complex, detailed models. Used together, they deftly meet the computing needs for technical end users while delivering services in an intuitive, user-friendly interface.

SGI® VizServer® servers with NICE DCV

SGI VizServer system with NICE DCV software is a commercially supported hardware and software solution that delivers efficient and optimized remote access to graphic-intensive, off-the-shelf 3D applications running on both Windows and Linux desktop environments, including major CAD, CAE, Petro-technical, medical and scientific visualization software.

NICE DCV It is the first software product on the market to allow sharing of a single physical GPU between multiple Windows and Linux sessions, while maintaining full OpenGL application acceleration and workstation-class performance: this makes SGI VizServer servers with NICE DCV the ideal choice for remote working and collaboration, allowing a better utilization of available hardware resources and enabling an efficient and responsive 3D Cloud experience.

SGI VizServer server with NICE DCV is integrated into NICE EnginFrame Views to provide 2D/3D session management via a web browser including the ability to share an interactive session with others for collaborative working. When coupled with EnginFrame HPC functionalities, engineers and researchers benefit from a user-friendly, web-based experience across their complete workflow, including state-of-the-art data and batch job management using their job scheduler of choice.

SGI VizServer with NICE Solution at a glance
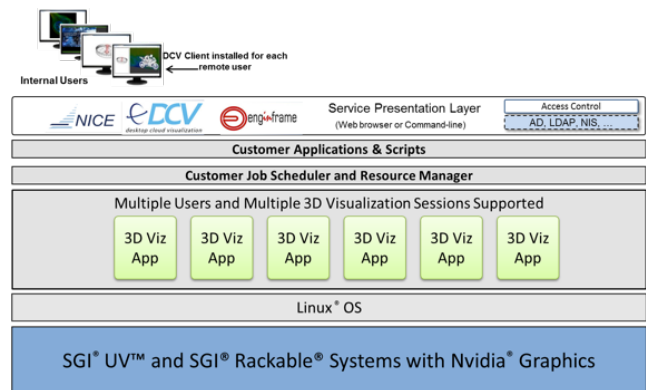
The SGI VizServer Solution's Software Components

Engineer-friendly self-service portal: The self-service portal enables engineers and scientists to access the applications and data in a web browser–based setting. It also provides security, monitoring, and management to ensure that users cannot leak company data and that IT managers can track usage. Engineers and scientists access applications and data directly from their web browsers, with no need for a separate software installation on their local client.

Resource control and abstraction layer: The resource control and abstraction layer lies underneath the portal, not visible to end users. It handles job scheduling, remote visualization, resource provisioning, interactive workloads, and distributed data management without detracting from the user experience. This layer translates the user request from the browser and facilitates the delivery of resources needed to complete the visualization or HPC tasks. This layer has a scalable architecture to work on a single cluster or shared memory server, as well as a multi-site WAN implementation.

Computational and storage resources: The SGI VizServer system with NICE DCV software takes advantage of the company's existing or newly purchased SGI industry-standard resources, such as servers, HPC schedulers, memory, graphical processing units (GPUs), and visualization servers, as well as the required storage to host application binaries, models and intermediate results. These are all accessed through the web-based portal via the resource control and abstraction layer and are provisioned according to the end user's needs by the middle layer.

How SGI VizServer Works

SGI VizServer systems with NICE DCV software give technical users remote 3D modeling tools through a web-based portal, allowing for GPU and resource sharing and secure data storage.

In a typical 3D visualization scenario, a software application uses local resources (CPU, memory, etc.) and sends a stream of graphics commands to a graphics adapter (GPU) installed on the workstation. The GPU renders the data into pixels and outputs them to the local display as a video signal.

Using SGI VizServer systems with NICE DCV software, all OpenGL® applications run natively on remote SGI servers with NVIDIA® Graphics cards, which may also be consolidated and virtualized. The native GPU driver renders the scene geometry and graphics state on the remote physical GPU, and pixels are compressed and sent over the network to the local display. The resulting pixel stream can be encrypted and distributed to multiple clients, to ensure secure real-time collaboration, and the compression ratio can be dynamically adapted to get the best experience on any network speed. See example below.
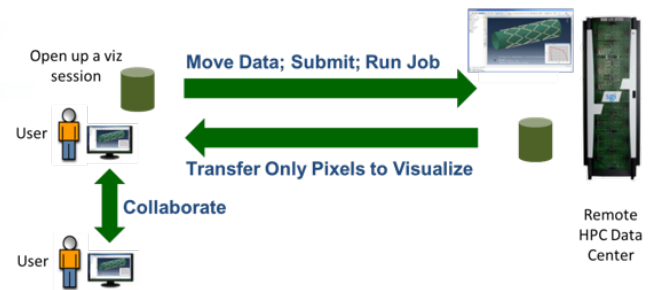
SGI VizServer systems with NICE DCV software can provide visualization capabilities through a software-as-a-service (SaaS) built in the company's private network. The software is accessed through an easy-to-use web interface, resulting in simplicity for the end user. This solution provides intuitive help and guidance to ensure that less-experienced users can maximize productivity without being hindered by complex IT processes.

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The SGI VizServer Solution's Hardware Components

SGI® Rackable® Standard Depth platform

SGI Rackable servers, model number C2108-RP2, support up to 256GB of memory per node in a dense architecture with up to 16 cores per 2U with support for Linux®, eight-core processors, GPU's and DDR3 memory.

Graphic Cards:

NVIDIA® Graphics cards supported on the SGI® Rackable® Standard Depth platform are:

- Quadro® K2000D (supports 2-4 users);
- Quadro® K5000 (supports 3-5 users)
- Quadro® K6000 (supports 6-8 users).

Operating Systems support:
- SUSE® Linux® Enterprise Server 11
- Red Hat® Enterprise Linux 6

EnginFrame Views web browser support:
- Chrome, Firefox, Safari, MSIE

SGI® UV™ 2000

SGI UV 2000 servers scale up to 256 sockets (2,048 cores, 4096 threads) with architectural support for up to 262,144 cores (32,768 sockets). Support for up to 64TB of global shared memory in a single system image enables CAE workflows can be accelerated for overall time to solution by running pre/Post-processing, solvers and visualization on one machine without moving data. Flexibility of sizing memory allocated to a job independently from the core allocation in a multi-user, heterogeneous workload environment prevents jobs requiring a large amount of memory from being starved for cores.

Graphic Cards:

NVIDIA® Graphics cards supported on the SGI® UV™ platform are:

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- Quadro K5000 (supports 3-5 users).

Operating Systems support:
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SGI VizServer Service Offerings

SGI Services personnel bring expertise and experience to help turn powerful technology into business solutions. To do this, SGI turns to the deep experience base of its service professionals, honed over decades. SGI has played a formative role in pioneering graphics technology since the mid-1980's, and no other company can provide the depth of Subject Matter Expertise, combined with tried and true experience in visualization technology.

Technical support is available around the globe up to 24 by 7. SGI offers additional professional services to accelerate customers' time to value and maximize return on investment.

SGI VizServer Service Offerings	
VizServer Proof of Concept (POC)	Allows customers to evaluate new approach to visualization with low initial investment. • 2 week POC
VizServer Quickstart	Provides fast ramp to productivity Basic product installation • Baseline DCV Installation • Baseline EnginFrame Installation • Baseline RealVNC • License Management • Baseline OpenLAVA Scheduler Install • Install Strawman Workflow/Scripting Knowledge Transfer: • Site reconfiguration training • What to look for in VizServer software, day-to-day operations, setup and troubleshooting. • Includes best practices of utilizing SGI service resources.
VizServer Tuning Services	SGI Service professionals tune and optimize software settings for the customer's workflow and environment • Single sites or multiple sites • Geographically diverse sites

For more information on SGI Services, please see www.sgi.com/services.