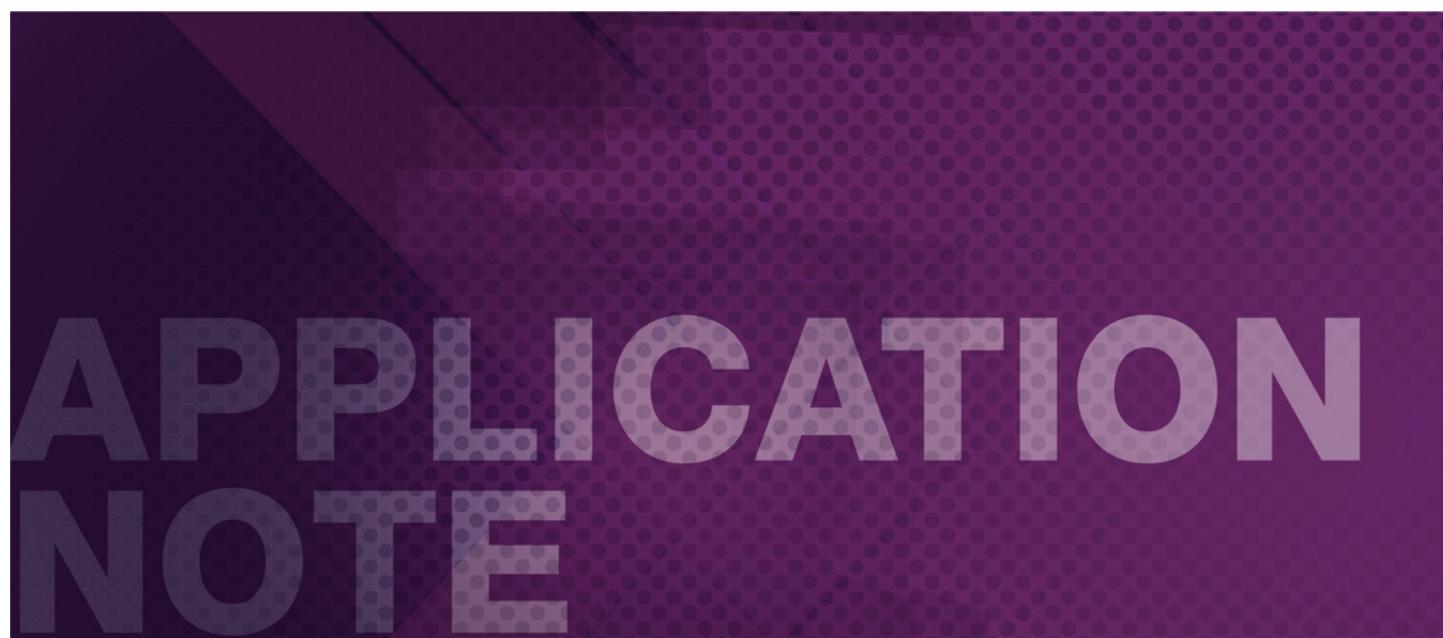




Intersite Networking and Configuration Requirements for GV STRATUS Multisite — A Guide for IT Personnel

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This document provides guidance for a GV STRATUS customer's IT personnel to understand the basic networking requirements of a GV STRATUS/K2 media server and storage system; and plan for the required connectivity prior to the deployment of a GV STRATUS systems across multiple sites linked by user-provided networks.

Introduction

The GV STRATUS application framework from Grass Valley, a Belden Brand, now supports Wide Area Network (WAN)-based workflows that enable multisite media processing from GV STRATUS clients across distributed facilities and from remote field locations. However, prior to applying multisite workflows, users need to plan and provision their GV STRATUS/K2 media server and storage system to seamlessly operate across all interconnecting networks.

This document provides guidance for customer's IT personnel to help:

- a) Understand the basic networking requirements of a GV STRATUS/K2 system
- b) Plan for the required connectivity prior to the deployment of GV STRATUS systems across multiple sites linked by user provided networks

Background: K2 and GV STRATUS Networking

GV STRATUS relies upon Grass Valley's K2 server and client infrastructure, which imposes a number of requirements for the IT networks interconnecting GV STRATUS and K2 devices.

The GV STRATUS/K2 framework is based on industry-standard networking components and protocols, simplifying the integration between GV STRATUS/K2 system and third-party devices.

The three distinct networks encountered in a GV STRATUS/K2 system are:

- Control network
- FTP streaming network
- iSCSI media network

The following section provides a requisite background on these three networks.

For more information, please see the K2 System Guide applicable to your version of the Grass Valley GV STRATUS/K2 software, available at www.grassvalley.com.

Control Network

In any GV STRATUS/K2 system, there will always be a control network connecting each of the individual devices in the system, allowing each device to request and receive various types of system control and housekeeping data. The control network is also used for software deployment during system delivery and subsequent updates through the Grass Valley SiteConfig tool. The control network should be allocated a dedicated subnet separate from other networks. However, it can share a VLAN with the FTP network. See the below section for more information.

Name resolution must be provided for all devices on the control network. The Grass Valley configuration and deployment tool (SiteConfig) facilitates central management and deployment of a system-wide hosts file to achieve this.

With the addition of GV STRATUS, the control network is also used to transport proxy media data — both files and a multicast stream where applicable — between system devices. The control network is based on industry-standard copper Gigabit Ethernet technologies.

A GV STRATUS/K2 solution will typically include network switches (HP 29xx series) to support the control network linking the Grass Valley devices that require a control connection. Customers may choose to supply their own switch hardware for the control network, provided it meets the networking requirements.

When GV STRATUS client software is deployed to PCs on a corporate network, the control network needs to be safely routed to that corporate network and provide access to the ports specified in the GV STRATUS/K2 system documentation.

FTP Streaming Network

GV STRATUS/K2 systems based on standalone server devices or SANs with one or more dedicated FTP servers will also have a separate FTP network for transfer of streaming high-resolution media files between devices. The FTP network uses industry-standard Gigabit Ethernet copper cable between devices. The FTP network must be provisioned on a subnet separate from the control network. The FTP network can share a VLAN with the control network, but having a separate VLAN will guarantee that time sensitive data on the control network will not be affected by FTP data transfers.

In large GV STRATUS/K2 systems, devices that have to handle large volumes of FTP traffic (e.g., FTP Core servers) are connected to the core network via 10 Gigabit Ethernet uplinks, usually via switches included in the Grass Valley solution. The FTP network is the primary gateway to transport data in and out of a GV STRATUS/K2 system for operations such as transcoding, archiving or media file transfers directly into and out of K2 storage.

Name resolution is to be provided for all devices on the FTP network. The Grass Valley configuration and deployment tool (SiteConfig) facilitates central management and deployment of a system-wide hosts file to achieve this. The FTP network addresses and hostnames (including the relevant '_he0' suffix) need to be registered to ensure that communication occurs between the intended devices and ports.

A GV STRATUS/K2 solution will typically include network switches (HP 29xx series) to support the FTP network linking the Grass Valley devices which need an FTP connection, including 10 Gigabit Ethernet uplinks from Grass Valley servers to the switch infrastructure. Customers are expected to allocate a single uplink to their network infrastructure. Where this requires a 10 Gigabit Ethernet connection, the user is responsible for furnishing any essential cabling and interface adapters. Users may choose to provide their own switch hardware for the FTP streaming network, provided it meets the networking requirements.

Background: K2 and GV STRATUS Networking (Cont.)

iSCSI Media Network

The majority of GV STRATUS installations are deployed as SAN-based systems. These configurations require an exclusive iSCSI-based media network to support real-time access to high-resolution data files on the K2 SAN for operations such as ingest, playout or editing. The iSCSI protocol allows for real-time management and delivery of high-resolution media to and from the critical broadcast devices in the system, while also enabling multiple levels of service for different devices. The iSCSI network must be a separate subnet from other networks and must not share a VLAN, or it may be provisioned on physically separate network switch(es).

A Grass Valley K2 SAN solution includes network switches (HP 29xx series) to support the iSCSI media network connecting high-resolution media devices such as K2 Summit clients, nonlinear editors, Removable Media Ingest (RMI) workstations, and the GV STRATUS Core Services (engines) for proxy generation, conform, and file transfers/exports. A SAN system will integrate one or more K2 Media server(s), each with a TCP Offload Engine (TOE) card to bridge the iSCSI network and the SAN storage. Where necessary, 10 Gigabit Ethernet uplinks to the switch infrastructure will be provisioned from the TOE cards of the K2 media servers. User supplied switches are not supported in the iSCSI media network.

GV STRATUS Multisite Requirements

To deploy GV STRATUS multisite capabilities requires the ability to link two or more GV STRATUS sites, so that they can share metadata and media assets. GV STRATUS users on any configured site can browse the assets of remote sites, view the proxy media of remote assets, and if required, instigate a high-resolution transfer copy (pull) to their local site. Users can also publish (push) assets to a remote site, including the ability to associate assets to remote NRCS placeholders/stories within Rundowns in the remote system. This allows a user to send video content to support playout of news items on a remote site provided by the GV STRATUS Rundown tool.

In order to enable GV STRATUS multisite, the following elements must be addressed:

- Licensing
- Networking
- Configuration

Licensing

Each GV STRATUS system expected to participate in a multisite ecosystem must be individually licensed for multisite. A multisite license can be applied to a new system at deployment time, or added to existing GV STRATUS systems. Please contact a Grass Valley sales representative for more information.

The multisite license role is applied to the License Manager of the Core server at each site.

Networking

Each GV STRATUS system must have the ability to connect to other licensed multisite systems over the network. Grass Valley does not provide intersite networking solutions, nor is it stipulating the type of network solution used. Grass Valley expects each user to employ network technology that best suits its needs, and in order to realize GV STRATUS multisite capabilities.

GV STRATUS multisite solution does not impose specific minimum latency requirements between sites. It is expected that typical non-satellite-based networks should not pose any issues. However, clients should take into consideration that practical network throughput for a TCP-based protocol is determined not only by the available connection bandwidth, but also affected by increased latency.

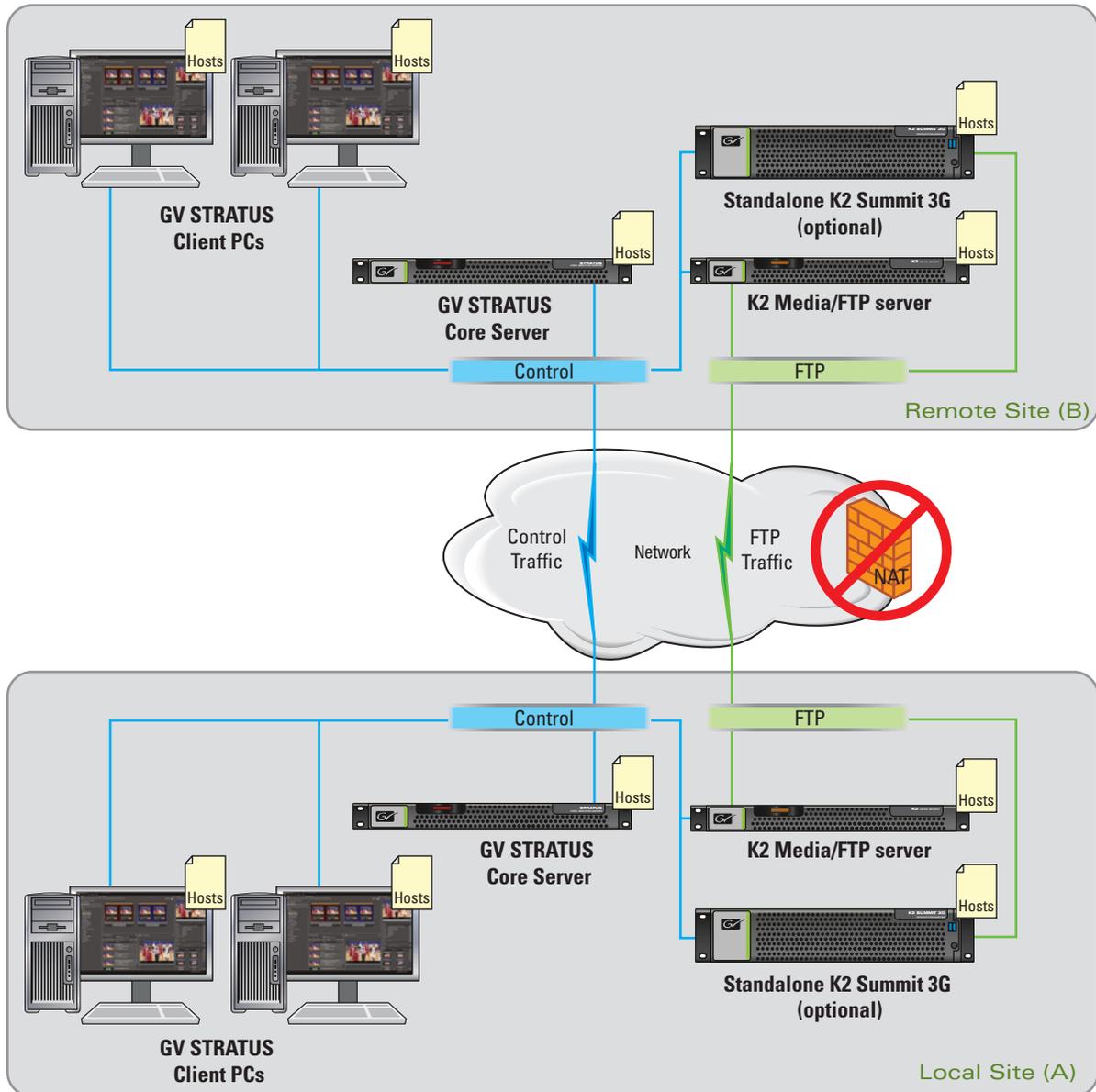
GV STRATUS Multisite Requirements (Cont.)

In order to enable GV STRATUS multisite, the following network requirements must be met:

- 1) The GV Control network must be routed between sites
- 2) GV STRATUS/K2 FTP traffic must be routed between sites
- 3) Name resolution is required between sites
- 4) Network address translation is not applied in the WAN

Note: If network address translation is applied in the WAN, it must be carefully taken into account when setting up name resolution across the entire system.

- 5) Correct ports must be enabled between sites



GV STRATUS Multisite Requirements (Cont.)

Details for each of the network requirements are provided below.

The GV Control network must be routed between sites

The Control network carries metadata between sites to allow search between GV STRATUS systems, metadata interchange between sites and the distribution of HTTP proxy.

GV STRATUS/K2 FTP traffic must be routed between sites

The FTP network used for media streaming on each site must be routed between each site participating in multisite transfers. The FTP network is used whenever a user on a GV STRATUS site initiates a high-resolution media transfer between sites.

Name resolution is required between sites

The GV STRATUS/K2 architecture relies upon working name resolution between all K2 and GV STRATUS devices, contributing to efficient and timely communication between the devices. In the majority of systems, host files are created, managed, and deployed centrally at each site through the Grass Valley SiteConfig tool. However, the scope of the SiteConfig is "local," meaning that users can only apply and manage hostnames and IP addresses of GV STRATUS components specific to their local site.

Any devices on a remote site (or sites) which will participate in GV STRATUS multisite must be manually added to the host file of the local site. The recommended method is to first configure the local sites by using the SiteConfig utility. Subsequently, portions of each of the remote site host files are manually copied and pasted between site host files.

In a GV STRATUS multisite system, the hosts file deployed to each device must include the hostnames (including 'hostname_he0' entries for any FTP devices) of any remote devices expected to participate in a multisite environment. Logically, the hostnames and IP addresses in a multisite system must be unique across all sites/devices.

At a local site, the host file will typically include:

- a) All K2 and GV STRATUS devices, including all client workstations and editors on the local site
- b) The GV STRATUS core server(s) on all remote sites
- c) Any FTP server devices on remote sites

Network address translation is not applied in the WAN

GV STRATUS expects to be able to connect to devices using the correct hostname and IP address for that device, over the native protocol intended for that traffic type. As a result, standard Network Address Translation (NAT) is not supported unless the NAT is engineered to be transparent to devices at each end of a connection. Users can decide whether their network requires a VPN type connection to tunnel the required protocols, or if their routing infrastructure can be configured to support multisite without VPNs.

Correct ports must be enabled between sites

GV STRATUS multisite requires FTP and HTTP traffic to be open between the sites.

Configuration

Detailed configuration information can be found in the GV STRATUS Installation and Service Manual. The following information is provided as an overview.

Each GV STRATUS system must be configured to know about the other sites to which it will connect. Multisite configuration is applied via the GV STRATUS Control Panel on each local system. Multisite configuration allows the local administrator at each site to name their remote sites with local user-friendly names and to apply the network details necessary to effect the connections required.

In the GV STRATUS Control Panel, the Remote Transfer Server value is typically set to "Automatic." This setting will allow any FTP capable server in the GV STRATUS system to transfer data. For instance, in systems including a SAN and standalones, the FTP servers for both parts of the system would be accessible.

If a fixed IP address is applied to the Remote Transfer Server field, the multisite transfer will only occur between the designated server and the remote system. This may be desirable in some systems, but might also limit some system components from participating in multisite transfers.

Summary

GV STRATUS multisite capability was designed for efficient integration with interconnecting IT networks. As with any complex system though, questions may arise.

Users who need additional information about GV STRATUS multisite provisioning should contact their local Grass Valley office for further assistance.

REFERENCES

- Grass Valley K2 Media Platform System Guide
- GV STRATUS Installation and Service Manual



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