White paper

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Bringing Order to the File Management Chaos Plaguing AEC Firms

How a Cloud-Based Solution, Supported by Edge Technology, Helps Architecture, Engineering and Construction Firms Boost Performance and Cut Costs

NASUNI

Executive summary

Architecture, engineering and construction firms have expanded their operations dramatically over the past few decades. And as design and engineering technology has advanced, these firms are working with ever-larger and more sophisticated file types to perform their day to day work when working locally and remotely. But for many, their legacy information systems are gasping for breath, trying to keep pace with these changes.

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Too often, highly skilled (and highly paid) architects and engineers working remotely are playing a waiting game at work – sitting idly for hours as their creaky on-prem infrastructure gradually grinds through their file-transfer requests. But speed isn't the only problem. The client-server systems are vulnerable to crashes and don't fully recover lost data. Multiple copies of a file reside in different locations, so users don't know if they have the latest version. Scaling requires adding more and more hardware. Maintenance is a costly headache.

All of these issues can be solved by moving from on-premise file services to cloud file services.

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With a single, global, cloud-based file system, files of any size can be easily shared with everyone in an organization. Thanks to the virtually unlimited storage capacity the cloud offers, scalability is no longer a concern. Backup and disaster recovery? No need to worry – it's handled automatically, with all the data intact. And this single file system eases security concerns, with centralized data allowing organizations to streamline project- and file-data access and reduce NTFS permission groups.

Finally, moving file management to the cloud lowers costs by eliminating hardware, streamlining maintenance and reducing the need for external support.

To turbocharge the speed of file-sharing through the cloud, leading AEC firms inject the power of edge appliances that cache relevant data. The performance boost gives engineers and architects the sense of pulling information straight from their local drives.

By implementing such systems, AEC firms give their end-users a seamless experience, greatly simplify operations, and reap significant cost savings. With the removal of long-standing operational pain points, firms can forget about file management and focus instead on client design work.

Burgeoning volume and ballooning files are pushing legacy systems to the breaking point

Architecture, Engineering and Construction (AEC) files have steadily grown in size and volume. The designs captured in files such as Revit, Microstation, and AutoCAD Civil 3D typically contain massive amounts of information, making them both incredibly detailed but also incredibly unwieldy from a file management perspective. Revit files with all x-references, for example, can easily reach a gig in size and link to other files of similar magnitude. Multiply that across jobs and site locations and AEC firms quickly are dealing with a daunting scale of file data.

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In addition to file growth, global expansion means that many firms operate across continents, with headquarters in one country and field offices in others. Mergers and acquisitions mean these already growing organizations often find themselves inheriting a wide variety of legacy systems. Add in staff turnover (not uncommon in AEC firms) and the problem is compounded by the loss of knowledgeable legacy IT professionals to maintain these systems.

Problems proliferate across the organization

Every individual site needs to ensure that it has easy access to all relevant information. This leads to the proliferation of file storage, backup, and disaster recovery systems across an organization's global footprint. Inconsistent drive mappings among locations makes it difficult to share files. (For example, one firm we've worked with reported that it was working with more than 200 drive mappings!) To further complicate matters, tools such as Revit and AutoCAD require driving mappings and relinking dozens of subfiles.

This local approach is not only costly, it creates siloed information, leading to uncertainty regarding "the truth" because stakeholders never know if they have the latest, most complete and up-to-date information

The systems traditionally used to manage files across multiple locations add another layer of complexity to the situation, with separate file storage solutions, disaster recovery platforms, and offsite archival storage devices. One case study suggests that for a typical AEC NAS system, 50TB of hardware is required to store 10TB of files when accounting for growth, off-site storage, and backups.

The client-server model for file management that many AEC firms continue to use was designed for an era in which smaller, more contained projects were the norm. They weren't intended for today's global reality. For this reason, these systems are now expensive to maintain. They require extensive IT support, they're not scalable (storage has to be refreshed every few years), and they result in a poor user experience.

The double-whammy of high cost and low reliability

Not only do these legacy systems require more and more hardware and maintenance, they are not particularly reliable. Indeed, companies have come to accept a 90% success rate when restoring files from a backup server "acceptable." Backup operations themselves also affect performance. Some firms have reported that they would attempt to write data to their servers, only to find that backups were still going on, negating their efforts.

Backed by the Cloud, powered by Nasuni provides:

- *80%+ Local Edge Hardware Reduction*
- *90% On-Premises Capacity Reduction*
- *Cloud Scale, Local Performance*
- *High-speed Global File Synchronization*
- *Billable Workers Are More Efficient*
- *Self-Service File Restores*

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Hardware and maintenance costs aside, these inefficient and unreliable systems also have an operational cost. Global AEC firms rely heavily on contractors who work on a billable hours basis. Consider the wastefulness of transmitting a large file from one location to another, idling contractors as they wait to receive it and put it in the proper directory structure. A 2GB file can take four hours to transfer from Houston to New York City using legacy systems. All of this consumes billable hours, representing a significant hidden cost that many organizations ignore.

There has to be a better way. And there is.

Creating calm and focus: The best path for AEC firms to migrate to the cloud

Imagine for a minute that your company's engineers and architects never had to wait to pull up a large file. Imagine that everyone in your organization – no matter where they were located – could access that file. Imagine that they'd all be assured that it was the latest version – that an architect in New York could retrieve a file that someone in Dubai had been working on five minutes earlier and not worry if all the updates had been captured. Imagine that file type didn't matter – it could be stored, retrieved and modified without any considerations of origin or program or pathing.

Further imagine that you never worried about a crash because redundancy was built into your infrastructure and files would not be lost, even if a data center were disabled by an earthquake. Imagine no longer worrying if you had employees on hand to update programs or swap out server drives. Imagine never waiting for a backup to run — or needing to assign a staff member to run that backup.

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Imagine a system that lets everyone focus on the work in front of them — free of the distractions created by a file management system that can't keep pace.

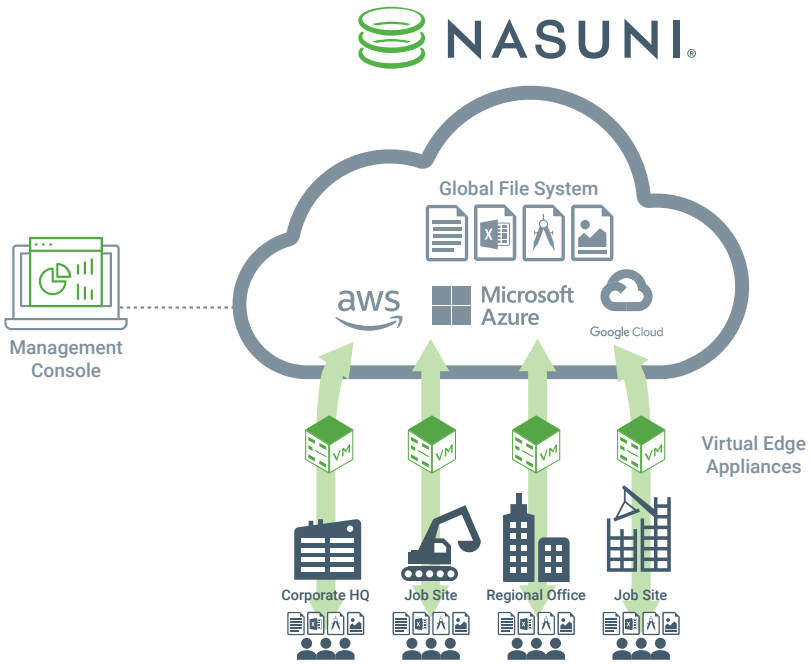
Leading enterprises have addressed their sprawling file management needs, and made the world depicted above a reality, by moving from on-prem systems to the cloud. They've found that using public cloud providers such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform provides uniformity of information, convenience, scalability, and effective backup/data recovery. Storage is no longer an issue because of the unlimited scalability of the cloud. Consolidation of information in the cloud makes data and file management easier. User roles can be defined so information is accessible to those who need it. What's more, this transformation facilitates maximum visibility into your file systems. Together with user access controls, this visibility makes it easier for organizations to meet all compliance and data retention requirements.

The heroic role of local edge appliances

While AEC firms certainly enjoy the many benefits the cloud provides, the size of the file sizes they rely on can cause delivery issues. Even when a cloud data center is relatively close to the location requesting a particular file, transmission inevitably has discernable delays that interfere with the user experience.

Most Edge Appliances are virtual machines that leverage your current systems.

There is an elegant solution to this issue that allows AEC firms to fully benefit from the cloud while avoiding those delays: installing edge appliances that cache the required data set. These appliances can be made to operate much the same way that the Apple Time Machine does, with continuous versioning of files to reflect only the modifications from the previous reading rather than replicating the entire file. Those files that are most frequently accessed are stored on the edge appliance while little-used files remain in the cloud until needed.



In real-world terms, this means that the load previously handled by a 50TB NetApp device can be shifted to a 5TB local edge appliance without a hiccup.

At last, a single source of truth

The beauty of the system just described is that it combines the scalable, centralized power of the cloud with the speed of the edge. In this way, AEC firms can avoid the issues associated with data silos because everything is stored in the cloud without sacrificing the user experience provided by local access. With all edge appliances connected to the cloud, firms also enable centralized management of the entire system. And with constant communication between the cloud and the edge, firms also solve issues associated with syncing; everyone can be certain that they have access to the same files, wherever that information was created and wherever they may need it.

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A low-turbulence ascent into the cloud

Given the complexity of the endeavor, it's important that firms follow a well-considered methodology in moving their on-prem files to a cloud-based system. The organization needs reassurance that the transition doesn't involve any loss of data and that the process can move along at a reasonable pace. To do that, the team executing the transition needs to break it into separate phases:

Removing the complexity of the current system and replacing it with simplified, effective tools and data telemetry is a high-value activity for IT departments.

Phase 1: Plan carefully and completely – To ensure a successful migration of files to the cloud, it's critical that the team implementing the new file management system follows a careful, well-reasoned methodology. The first step is the creation of a conceptual design for the new system, a design that lays out the high-level architecture for the system and accounts for the overarching, user-facing drive structure, support workflows and so on. The next step involves populating the conceptual design with specific criteria relevant to each site location. Based on these first two steps, planners can assess resource needs for the project, both in terms of physical hardware and the skill sets required.

Phase 2: Focus on high-ROI criteria – The execution needs to be cognizant of business drivers, which typically fall into three categories:

- **Functionality/workflow:** Do the changes enhance user workflow? Will it increase productivity and remove current hurdles?
- **Financial:** Performing migrations at multiple sites is key to containing labor costs. ROI is also affected by the speed with which the plan turns off legacy servers and storage and backup.
- **Steady state management/support for IT employees:** Removing the complexity of the current system and replacing it with simplified, effective tools and data telemetry is a high-value activity for IT departments.

Phase 3: Communication and education – A successful migration from an on-prem file management infrastructure to a cloud-based system will require thoughtful and proactive change management. The legacy system is what most employees are used to and they'll need some time to unlearn old work habits and develop new ones. Ideally, education and training efforts will commence weeks in advance of the migration. These efforts should include both company-wide communications as well as briefing and training of anyone responsible for supporting and guiding employees, whether locally or remotely during the transition. Once the organization has switched over to the new system, processes must also be in place for ongoing training to address any lingering confusion or adoption challenges.

Phase 4: Implement a file-sharing structure – Now that all the sites are in the cloud, it's time to start taking advantage of file-sharing possibilities and establish a single source files for all locations on a given project. Doing so clarifies which files are canonical and eliminates the complications associated with maintaining multiple versions of files across different locations.

Phase 5: Tap into unique cloud features – Once all files have been moved to the cloud, AEC firms can begin to take advantage of other unique cloud services, such as artificial intelligence and analytics. For example, both AWS and Azure offer powerful analytics services that can provide insight into file size and file usage, for example, as well as performing tasks such as tagging image files at scale. These services can greatly improve business operations and further reduce file management spend.

The benefits: Quicker work, less confusion, streamlined processes

Once implemented, a cloud-based system that's augmented with edge appliances and consolidated controls creates huge payoffs for AEC firms.

Costs associated with slow file-transfer times go away as users remain productive through ready availability of the files they need. There are no more hours of waiting as a large file lumbers from one location to the next.

With the redundancy inherent in cloud systems (and borne by the providers, not the AEC firm), business continuity is close to constant. The waiting for backups to complete is eliminated. Data protection costs are trimmed and the threat of disasters mitigated.

By eliminating the burden, costs and human resources required by legacy systems, AEC companies can have more agility in their designs. Changes are noted as they happen and the wasteful efforts of the past in making sure a design is the current version are eradicated.

This becomes a strategic advantage as well, as firms can acquire other AEC organizations and maintain a high-quality work product across the varying offices, design shops and job sites.

Ready to bring order to your file-management system? Get in touch!

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About Nasuni

Nasuni is a file services platform built for the cloud, powered by the world's only global file system. Nasuni consolidates network attached storage (NAS) and file server silos in cloud storage, delivering infinite scale, built-in backup, global file sharing, and local file server performance, all at half the cost of traditional file infrastructures. Leading companies from a wide array of industries rely on Nasuni to share and collaborate on files across multiple sites, enhance workforce productivity, reduce IT cost and complexity, and maximize the business value of their file data. Sectors served by Nasuni include manufacturing, construction, creative services, technology, pharmaceuticals, consumer goods, oil and gas, financial services, and public sector agencies. Nasuni is based in Boston, Mass. For more information, visit www.nasuni.com.

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