



PROJECT BRIEF: DESSINN'S / SERAFIN

Serafin is a live-action/3D CGI television episodic series/novella. The organizations involved in Serafin's production and logistics include Dessinn's (Producer Jose Alberto Castro), Televisa®, TELMEX® (of the Grupo Carso® family under Carlos Slim Helú), Red Uno®, Insys® and, of course, Lakhvinder™.

The series production involved 2 episodes/day with live action shot on location in Mexico and a complete “virtual studio” and “distributed meta/grid-computing facility” seamlessly producing modeling, geometry, materials and animation at Dessinn's in Mexico with Super Computing and other aspects at Lakhvinder™ in California, United States. Additionally, some other aspects such as compositing and image processing, were performed seamlessly in both Mexico and California.

Lakhvinder™ assembled and operated the “virtual studio” for this production before “virtual studio” was even a concept. The Dessinn's-Lakhvinder™ “virtual studio” and “distributed meta/grid-computing facility” were an operational reality before “virtual studio” was even a concept and while “distributed meta-computing facilities” and “Grid” are still goals and under research and development in the rest of the world. Lakhvinder™ delivered an operational reality, with incredible cost-effectiveness, whilst the world to this day still continues to strive to reach the goals of what Lakhvinder™ has already achieved and surpassed.

Lakhvinder™ developed the custom software and integrated it with all of the systems, software, processes and methodologies including the Dessinn's production flow and style. The existing Lakhvinder™ developed intelligent scheduler kept the myriad, varied complexities timed and ordered with concurrent timing and interdependent hierarchical prerequisites and ordering preserved and compensated for-- all amidst the inevitable unstructured chaos.

The computing systems included Silicon Graphics® IRIX®/MIPS® workstations, intel®/windows®-based workstations and intel®/windows®-based servers on the Dessinn's end, and, at Lakhvinder™ included Silicon Graphics® IRIX®/MIPS® Big Iron, intel®/windows®-based clusters, and intel®/windows®-based servers. A seamless, heterogeneous, distributed “grid” tied together by Lakhvinder™-- far ahead of it's time. Seamlessly, transparently, invisibly operating under the familiar local interfaces-- and used by Producers, Modelers, Animators, Coordinators, Secretaries, and Dessinn's preexisting Systems Administrators-- all with no additional training, only their preexisting skill sets.

Lakhvinder™ provided technical, operations and process consulting on the fly during production. The entire operation and processes were laid out and executed in a distinctively Mexican style and flow with no disruption to Dessinn's-- only vanishing problems. The entire data hierarchy and handling was en Español. Lakhvinder™ had the pleasure and honor of adapting to, and becoming part of, the beautiful Mexican culture, style and flow.

The long range interconnect for the entire system was through the internet via the backbones of TELMEX® and Red Uno®. Lakhvinder™ provided considerable technical consulting, diagnostics, troubleshooting and solutions to TELMEX® and Red Uno® on

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behalf of Dessinn's.

The long range interconnect through the internet was a VPN fully encrypted for authentication, tamper prevention and fully encrypted data/payload. Furthermore, the interconnect was protected by application-level proxy firewalls. The base VPN and base firewall were Axent® Raptor Firewalls, selected by Lakhvinder™. Lakhvinder™ developed and added sub-components to the base Axent® VPN and Axent® Firewall, to provide for authentication, SSO (single-sign-on), and to provide for application-level proxy protection for the custom protocols and systems of the “grid”. The Dessinn's Axent® software, firewall hardware and a server were supplied and installed by Insys®. Insys® is a Mexico based corporation which was recommended and brought in by Lakhvinder™. Upon the installation by Insys®, Lakhvinder™ configured, modified and operated the Dessinn's firewall and VPN.

Lakhvinder™ developed and operated a Global Synchronization System for the project. The Synchronization system synchronized all data for the entire project across Mexico and California. The synchronization system, and the entire grid system, were operational 24x7. The synchronization system's nominal mode of operation was synchronous (symmetric real-time synchronization). Whilst the nominal mode of operation was synchronous, the system also had a contingency fallback to asynchronous (asymmetric non-real-time synchronization). The fallback to asynchronous served two purposes, contingency and economy.

The fallback towards asynchronous was applied progressively with the subsequent resumption towards synchronous also applied progressively, all governed by a pre-configured set of logic rules. The contingency purpose addressed the event of network congestion, network failure or other incidents. In the event of network congestion, the system would fallback progressively towards asynchronous governed by a set of logic rules. In the event of network failure the system would employ autonomous multi-nodal rolling caches, then upon network resumption, the system was built to unroll the caches asynchronously governed by a pre-configured set of logic rules.

The economic purpose allowed for minimization of cost by negating the need for higher bandwidth during periods of peak data creation/generation. During these conditions, fallback to asynchronous was applied progressively to select types of data whilst still applying synchronous to the data which must be symmetric in real-time-- all governed by a set of logic rules. The subsequent synchronous resumption was applied progressively vice versa.

The system applied local file locks and global file locks in a manner appropriate to the type and nature of the file/data and as a function of the relevant application(s). Dessinn's personnel were observing Lakhvinder™ generated data appearing on their local machines in real-time as if it had been generated locally. As they observed, in real-time, they could modify the Dessinn's data locally and then observe the Lakhvinder™ generated data change accordingly either (next iteration / next time step) or (immediate rollback / resume) as appropriate for the process in question and as a function of the application(s). Data was live and in-use in Mexico and California 24x7, all synchronized and governed with a set of logic rules, transparently to the users. Changes in data with respect to simulations and processes underway, were governed transparently with an automated and integrated set of logic rules constantly making adjustment for timing, ordering, scheduling, precedence and interdependency with respect to processes, workflows, data sets and as a function of the application(s).

The entire system was developed, modeled, simulated and prototyped using Wolfram Research® Mathematica®. The system was then deployed in the appropriate language and environment for each subsystem and subsystem component .



TELMEX® and Red Uno® installed the Dessinn's Internet. Insys® installed the Dessinn's firewall hardware, base firewall software and base server. From that point Lakhvinder™ was able to instruct one Dessinn's Systems Administrator to insert CD's and execute a few files-- Lakhvinder™ then installed, configured and operated the entire system for the duration of the project remotely. Lakhvinder™ personnel never set foot on Mexican soil. Lakhvinder™ configured and operated the entire system from Lakhvinder™ in California.

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