Introduction to SuperMap iExpress 9D

- Cloud GIS Distribution Server

SuperMap iExpress 9D is a GIS distributor server based on cloud technology. iExpress as the intermediary between cloud and terminal, greatly improved the experience of GIS terminal. And provides functions of map, 3D tile local publishing and multi-node pushing technology, can quickly build cross platform WebGIS application system.

Fig. 1 SuperMap iExpress 9D Cloud GIS Distribution Server

Who needs SuperMap iExpress 9D?

- Developers and user organization who develop WebGIS map applications and online map applications
- Smart city construction and application organization
- GIS cloud construction and application organization

Why SuperMap iExpress 9D?

- Can be used as cross-platform, low-cost GIS server, independently providing tile based map services, 3D services, compatible with SuperMap iServer interface, can be upgraded smoothly.
- Can be set as front-end processor, providing full functions of GIS server proxy mechanism and cache technology, solving the problem of non-smooth experience due to network when connecting GIS cloud, which improved access speed, lowered server pressure.

Product Features

1. Multiple Service Proxy and Cluster
iExpress can re-publish GIS services for local users through web services, greatly improved the access efficiency of local users. Meantime, the multiple maps, data services published by proxy can be aggregated as one service to publish, realizing the integration of multi-sources, heterogeneous geo-information and services.

Fig. 2 Multiple remote GIS services proxy

- iExpress provides quick publishing service, batch publishing services, etc., assisting realizing quickly distributing nodes. The supported GIS services include:
- Supports iServer REST services, including map service, data service, spatial analysis service, network analysis service, traffic transfer service, 3D service, address matching service.
- Supports online map proxy, including Bing Maps, OpenStreetMap, etc.
- Supports OGC services, including WFS, WMS, WMTS services
- Supports map service of 3rd party platform, including map service, element service and network analysis service of ArcGIS REST
- Supports dynamic remote iServer service proxy and update service status to sync with iServer.

2. Service Distribution Ability

SuperMap iExpress provides rich service interface types, supporting publishing remote service, tile package as multiple services, which is not only SuperMap REST service, but also OGC standard services like WMTS, WMS, WFS, etc. In addition, it also supports publishing as multiple 3rd-party services for accessing and using for different terminals.
3. **2D & 3D Tile Direct Publishing**

- iExpress supports publishing current tiles as map services or 3D services, therefore independent GIS services can be provided, no need to depend on remote services.
- Supports directly publishing map tiles and vector tiles as map service. Map tiles are suitable for base map data without frequent updates, vector tiles can be used for interaction operations like query and highlight, therefore are more suitable for high-efficiency land elements (like POI).
- Supports 2D map and 3D image, terrain tile stored in MongoDB publishing as 3D service, directly open in 3D scenes.

<table>
<thead>
<tr>
<th>Class</th>
<th>Tile Formats</th>
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<tbody>
<tr>
<td>Distribution Storage Map Tiles</td>
<td>FastDFS, MongoDB storage tiles</td>
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<tr>
<td>Standard Map Tiles</td>
<td>GeoPackage, MBTiles</td>
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<td>SuperMap Map Tiles</td>
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<tr>
<td>SuperMapVector Tiles</td>
<td>SVTiles</td>
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<tr>
<td>Third Party Map Tiles</td>
<td>Third party TPK tile packages</td>
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</table>

Fig. 3 Service Distribution
4. Intelligent Tile Distribution and Update Strategy

iExpress provides multiple 2D, 3D tile cache and requests like query, analysis to speed up remote server, and provides intelligent tile distribution and update strategies.

- Tiles Distribution by area, time

iExpress automatically accepts 2D & 3D tiles by proxy iServer nodes; supports distributing by designated services and scale; supports distributing by geographic area; supports distributing at fixed time and periodically.

- Fixed Time Pre-Cache

iExpress supports online tiling for all the published REST map services to speed up the published map services. Pre-cache function can set time and supports distributed storage, visualization management and the quick use of tiles.
5. Service Acceleration Solution

- SuperMap service acceleration solution acquires SuperMap iExpress, SuperMap iServer and SuperMap iClient altogether, flexible for acceleration requirements for different environment, helping users quickly deploying acceleration system.

- Geo-CDN Acceleration Solution
- Basing on CDN (Content Delivery Network) technology, SuperMap raised an acceleration system which is more suitable for GIS- Geo-CDN. Deploying SuperMap iExpress near the users, as a GIS distribution server, iExpress can quickly respond to requirements of users through GIS service proxy and distribution, full angle cache, etc. When there is large access requests, it can relieve bandwidth pressure of cloud GIS center.

Front Machine Solution
Front Machine solution is to deploy iExpress near client terminal. iExpress as a front server layer, can provide services for nearest locations. Unlike Geo-CDN, front machine solution does not need third party loading equipment, which can be deployed and accelerated by iServer, iExpress, iClient directly. With IP address setting function of iServer and service querying mechanism by iClient, the user requests can be distributed to multiple iExpress, which can effectively improve the parallel service accessing.

Fig 6 Acceleration Service Access
- **Reverse Proxy Solution**
- Reverse proxy solution is to deploy iExpress on server terminal, which is on the same side with iServer and executing fault-tolerant deployment mechanism. The solution can avoid the frequent interaction between client and iServer, which lowers the pressure of iServer. Reverse proxy solution can lower the cost to extend volume of server terminal, which is more suitable for medium and small scale GIS application systems.