

(12) **United States Patent**  
**Levanon et al.**

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(54) **OPTIMIZED IMAGE DELIVERY OVER LIMITED BANDWIDTH COMMUNICATION CHANNELS**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.  
  
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**Related U.S. Application Data**

(63) Continuation of application No. 13/027,929, filed on Feb. 15, 2011, now Pat. No. 8,924,506, which is a continuation-in-part of application No. 12/619,643, filed on Nov. 16, 2009, now Pat. No. 7,908,343, which

(Continued)

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**G06F 15/16** (2006.01)  
**H04L 29/06** (2006.01)

(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04L 65/602** (2013.01); **G06F 3/1454** (2013.01); **G06T 3/4092** (2013.01); **H04L 67/42** (2013.01); **G09G 2340/02** (2013.01); **G09G 2350/00** (2013.01)

(58) **Field of Classification Search**

CPC ..... G06T 3/4092; G09G 2340/02; G06F 3/14  
USPC ..... 709/202, 203, 217, 230, 246, 247;  
345/625; 382/232, 305

See application file for complete search history.

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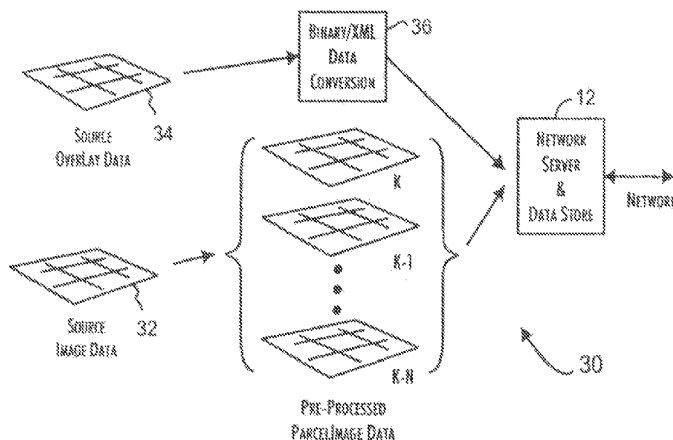
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(57) **ABSTRACT**

Large-scale images are retrieved over network communications channels for display on a client device by selecting an update image parcel relative to an operator controlled image viewpoint to display via the client device. A request is prepared for the update image parcel and associated with a request queue for subsequent issuance over a communications channel. The update image parcel is received from the communications channel and displayed as a discrete portion of the predetermined image. The update image parcel optimally has a fixed pixel array size, is received in a single and or plurality of network data packets, and were the fixed pixel array may be constrained to a resolution less than or equal to the resolution of the client device display.

**25 Claims, 5 Drawing Sheets**



**Related U.S. Application Data**

is a continuation of application No. 10/035,987, filed on Dec. 24, 2001, now Pat. No. 7,644,131.

- (60) Provisional application No. 60/258,465, filed on Dec. 27, 2000, provisional application No. 60/258,466, filed on Dec. 27, 2000, provisional application No. 60/258,467, filed on Dec. 27, 2000, provisional application No. 60/258,468, filed on Dec. 27, 2000, provisional application No. 60/258,488, filed on Dec. 27, 2000, provisional application No. 60/258,489, filed on Dec. 27, 2000.
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**G06F 3/14** (2006.01)  
**G06T 3/40** (2006.01)

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Numbering of Claim Elements of Challenged Claims of the 506 Patent, (all pages).

Claim chart illustrating teachings of Potmesil (Ex. 1002) and Hornbacker (Ex. 1003) pertinent to elements of Challenged Claims (all pages).

Claim chart illustrating teachings of Rutledge (Ex. 1006), Ligtenberg (Ex. 1005), and Cooper (Ex. 1007) pertinent to elements of Challenged Claims (all pages).

Claim chart illustrating teachings of Rutledge (Ex. 1006), Ligtenberg (Ex. 1005), Cooper (Ex. 1007), and Hassan (Ex. 1008) pertinent to elements of Challenged Claims (all pages).

Claim chart illustrating teachings of Fuller (App. E) and Hornbacker (Ex. 1003) pertinent to elements of Challenged Claims (all pages).

Claim chart illustrating teachings of Yap (App. J) and Rabinovich (App. R) pertinent to elements of Challenged Claims (all pages).

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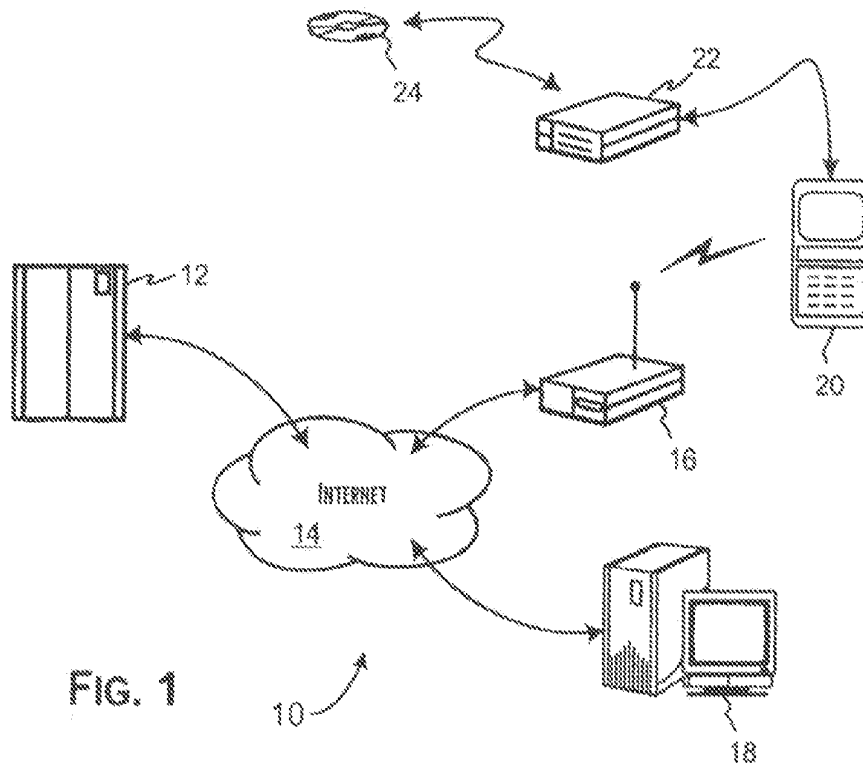


FIG. 1

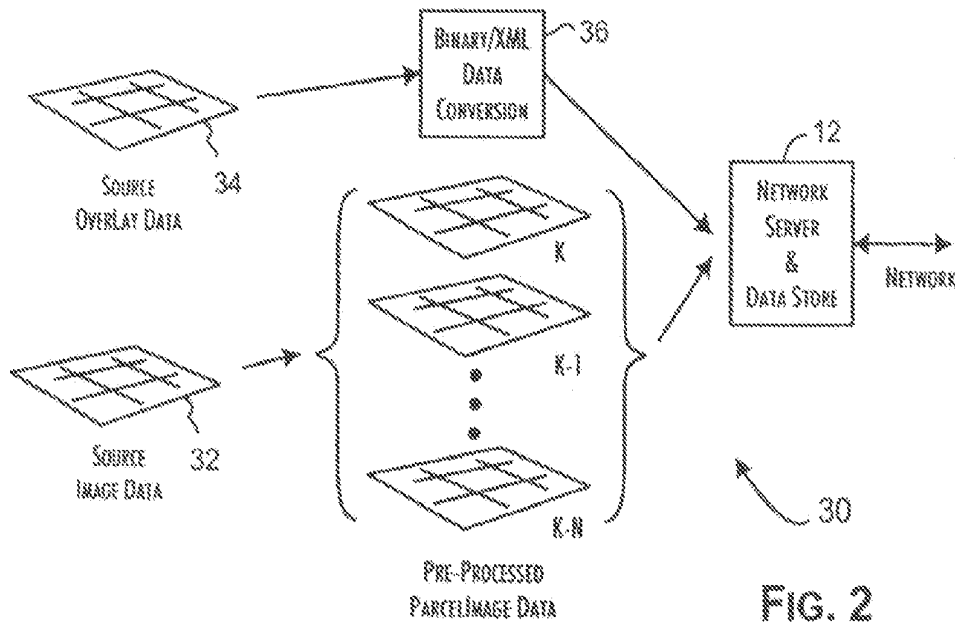


FIG. 2

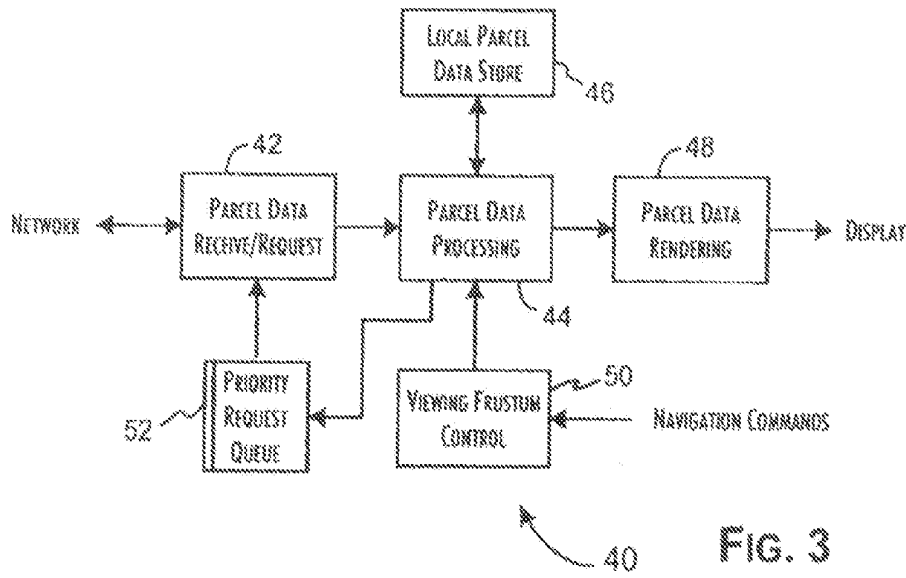


FIG. 3

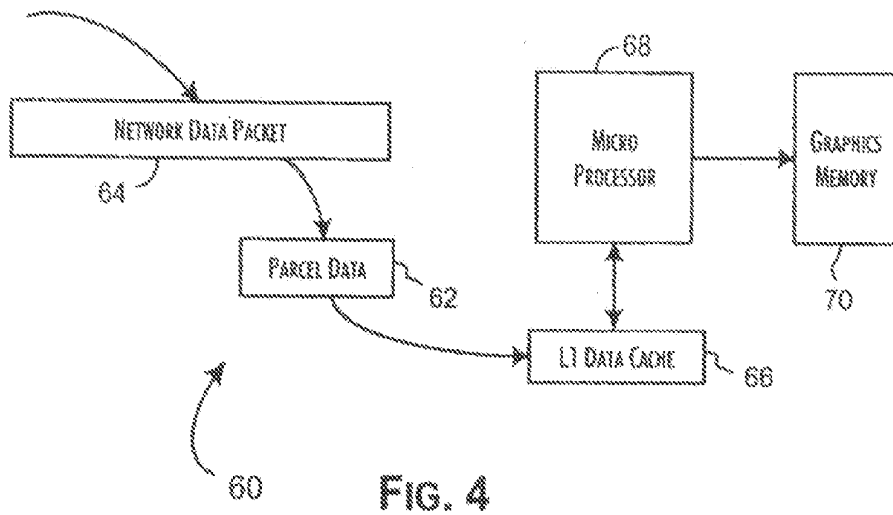
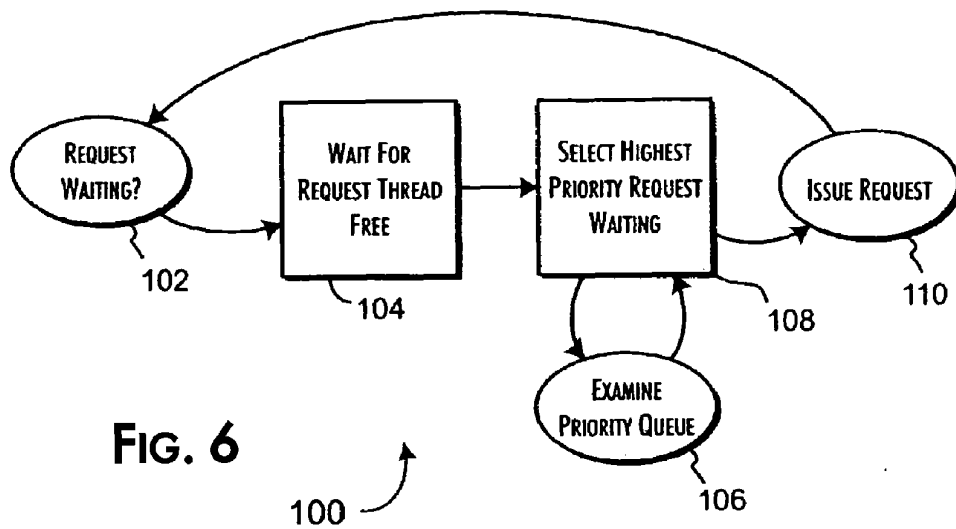
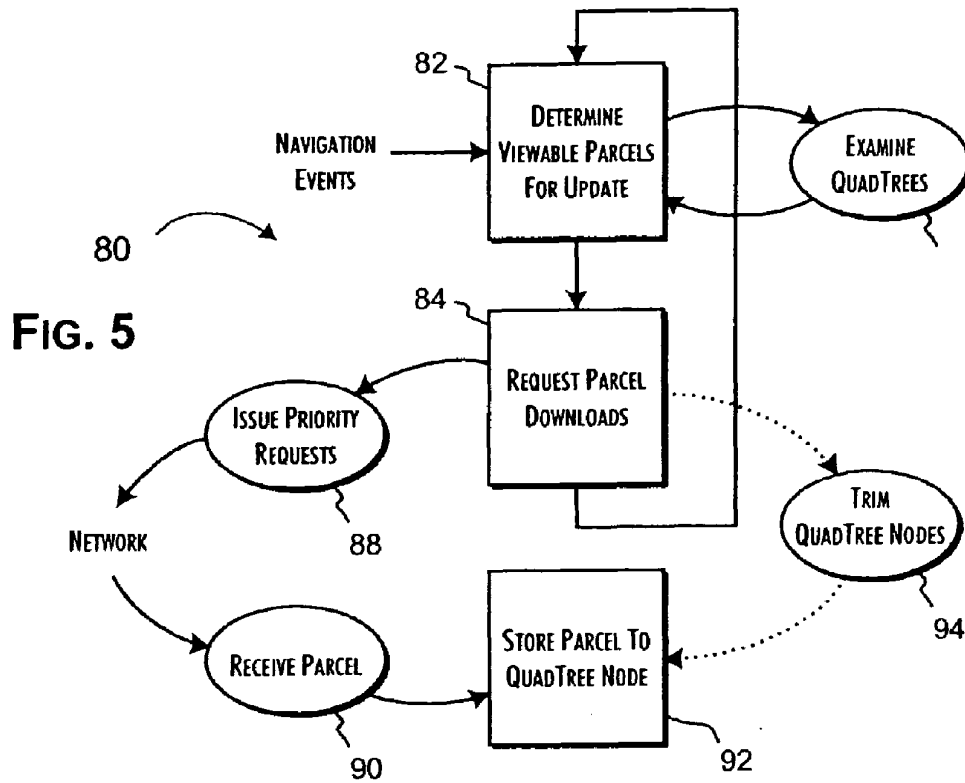


FIG. 4



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