



**Real-time Game
Information (Game Clock)
Partner Specification**

National Football League

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Document Revision History

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1.0	11/26/01	John Cave	Draft document created.
1.1	5/21/02	John Cave	Clock Source and Play Review indicators added at positions 28-29.
1.2	5/30/2007	John Cave	Added Play Clock at positions 30-31
1.2.1	9/24/07	John Cave	Included example clock packets for PAT and Free Kicks
1.2.2	11/4/08	John Cave	Added source of "X" for in-stadium use by Motorola

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1 Overview

The GSIS (Game Statistics and Information System) application running at all NFL stadiums transmits game clock and game state information (i.e. score, down, distance, yard line, quarter, possession etc.) in real-time to the distribution center at the NFL league offices in New York City. Business partners of the NFL may receive this data feed as required.

2 High Level Design

2.1 In Stadium

Two GSIS laptops in each stadium are connected to the scoreboard game clock feed. This clock feed typically comes from the scoreboard controller and feeds into a Blackbox DB-8 (Data Broadcast) unit that splits the serial clock signal into 8 different ports. GSIS uses 2 of the 8 ports and the signal is amplified for a long distance run to the stats booth using a pair of short haul modems.

When the game clock is running, GSIS will receive the new clock time and then extract the score and situation information from GSIS and construct a 31-byte packet that is sent to the distribution center. The distribution center will receive a packet once per second as the clock time changes.

When the game clock is stopped, GSIS will send a packet to the distribution center every two seconds.

Note: when more than one computer at the stadium is connected to the clock source, you will receive more than one packet each time the clock changes.

2.2 Distribution Center

The GSIS Partner clock program is running on a fault tolerant clustered server. It receives game information packets from all of the stadiums. This program maintains a list of the partners authorized to receive this information. Each game day, a partner must first register with this program in order for the program to begin sending data to the partner. The program will continue to send data to the partner until the partner un-registers with the program or 18 hours have transpired. Please note that if a partner has registered as "Partner A" on computer "A" and then registers as "Partner A" on computer "B", the clock server will stop sending to computer "A". If a partner needs to receive the data on more than one computer then additional client IDs must be set up.

The GSIS Partner clock program can also be run on another computer to receive data from another GSIS Partner clock program. This is typically done when the game information needs to be accessed from a publicly available machine such as a machine connected to the Internet. In this case, a game packet is sent from the stadium to the GSIS server that then forwards the packet to the publicly available machine. The publicly available machine then forwards the packet to the business partner.

In the event a clock signal from a stadium is unavailable, the GSIS Partner clock program will query the GSIS datamart database every 15 seconds to regenerate the 31-byte packet as if it had come from the stadium. The clock time of this packet will normally be the start time of the most recent play.

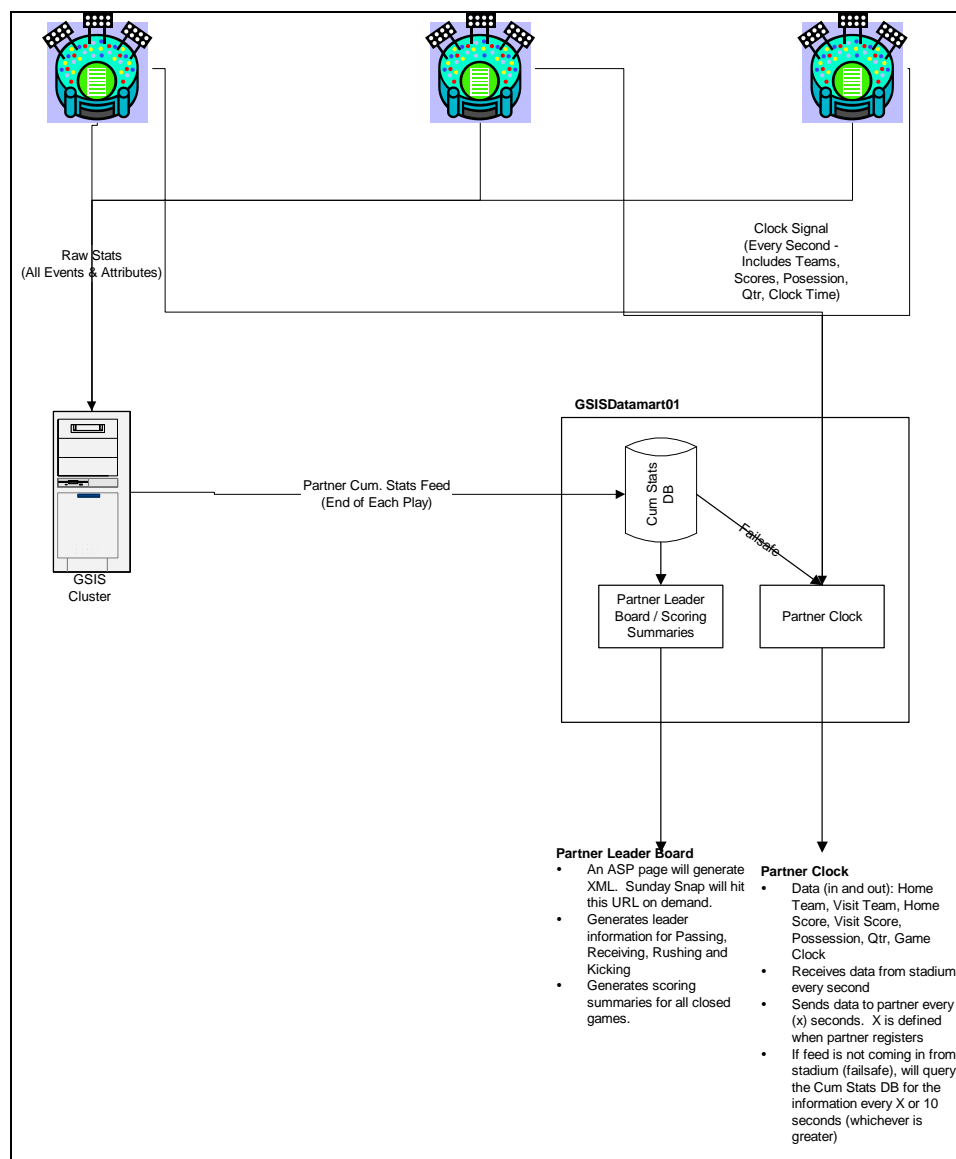


Figure 1

3 Networking Requirements

To receive this data feed, a business partner must have a dedicated ISDN connection with the GSIS distribution center network. For ISDN connectivity, please contact the NFL for more information on the installation and configuration of network hardware.

4 Partner Software Requirements

Outlined below are the steps required for a business partner to write their own software to receive the real-time game information feed from GSIS. You may request sample VB source code from the NFL for testing purposes and/or a baseline for your development effort.

1. On a separate thread, open UDP socket port 50,000 for reading
2. On a separate thread, open UDP socket port 50,001 for reading
3. Send a registration request packet on port 50,001 to the IP address (172.19.1.103 or 204.141.106.136) of the computer running the GSIS Partner clock program. The packet should look as follows:
GSISClockRegRequest,<Client Id>,,1
where <Client Id> is the Id assigned to you by the NFL.
4. If the registration request was successfully received by the GSIS Partner clock program you should immediately received a packet on UDP port 50,001. This packet will appear comma delimited as follows: GSISClockRegResponse,<Success or other>,<reason for failure>.

For example, a successful registration will return the following packet:

GSISClockRegResponse,Success,1

Note: the 1 indicates that the interval time is 1 second

A failed registration will return a value other than "Success" in the second part of the string and the reason for failure in the third part of the string. Or, if the packet never reached the server then your program should timeout after 3 seconds indicating a failure to register with the GSIS partner clock program.

5. After the registration has been successfully completed, your program will begin receiving game information packets on UDP port 50,000 for all games in progress. See the Data Specification section for a definition of the game information packet. If you don't receive a packet for a specific game within 20 seconds, your program should indicate some sort of failure.
6. Upon graceful termination of your program, you should send the following packet on UDP port 50,001 to the GSIS Partner clock program so that packets are no longer sent to your computer's IP address: GSISClockUnRegRequest,<ClientID used in step 3>

5 Data Specification

The 31-byte packet of information is defined as follows:

Starting Byte	Size	Data	Description
1	3	Home Club Code	Club code of the home team. Standard NFL club codes (i.e. NYG, JAX, KC, CHI)
4	4	Clock Time	Time on the game clock in the stadium. 1500 represents 15:00. This field will be padded with leading zeros when the clock time is less than 1000. For example, 50 seconds will be represented as 0050. Important Note: when the game phase is non-numeric (i.e. pre-game, halftime, final etc.) you should not rely on the value in this field.
8	3	Visit Club Code	Club code of the visiting team. Standard NFL club codes (i.e. NYG, JAX, KC, CHI)
11	3	Home Score	3-digit score padded with leading zeros
14	3	Visit Score	3-digit score padded with leading zeros
17	1	Home Team Has Possession	This field indicates the team with possession. 0 indicates the visiting team, 1 indicates the home team.
18	1	Game Phase	P – Pregame 1 – 1 st quarter 2 – 2 nd quarter H – Halftime 3 – 3 rd quarter 4 – 4 th quarter F – Final (no overtime) 5– 1 st overtime 6– 2 nd overtime 7– 3 rd overtime . . n – (n – 4) overtime f – Final Overtime
19	1	Down	Current down Will be 0 during a PAT and Free Kick.
20	2	Yards To Go	Current yards to go. Padded with a leading zero. Will be 0 during a PAT and Free Kick.
22	6	Yard Line	Current yardline. Formatted as: XXX YY where XXX is the club

			club code and YY is the yardline. Example: NYG 46 (with a space between the team code and the yardline).
28	1	Clock Source	Source of the clock signal (S=Stadium, T=Tester, F=Faker, L=Last play start time, X=Motorola usage) X – This source is available in-stadium only. When the clock signal is lost, the primary computer will send an “X” source approximately every 4 seconds to in-stadium addresses containing all of the information in the packet except the game clock and play clock times.
29	1	Play Review	Indicates whether or not the current play is under review by the referee. (0=False, 1=True)
30	2	Play Clock	Time on the play clock in the stadium. 05 represents :05. This field will be padded with leading zeros when the clock time is less than 10. For example, 5 seconds will be represented as 05. Important Note: when the game phase is non-numeric (i.e. pre-game, halftime, final etc.) you should not rely on the value in this field.

Sample Clock Packets

Type	Contents of Clock Packet
Play from scrimmage	GB 0900SD 01000702304SD 40 S000
PAT	PHI1245DET02700712000DET 2 S000
Free Kick	PHI1245DET02800712000PHI 30S000
X – Clock Source	PHI0000GB 0170101P110PHI 20X000